LAWRENCE BERKELEY NATIONAL LABORATORY LONG-RANGE DEVELOPMENT PLAN

Draft Environmental Impact Report

Prepared for:
Lawrence Berkeley National Laboratory

January 22, 2007

ESA

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CHAPTER I
Introduction

I.A. Overview

This environmental impact report (EIR) has been prepared pursuant to the applicable provisions of the California Environmental Quality Act (CEQA) and its implementing guidelines (CEQA Guidelines), and the Amended University of California Procedures for Implementation of the California Environmental Quality Act (UC CEQA Procedures). The University of California (UC or the University) is the lead agency for this EIR, which examines the overall effects of implementation of the proposed 2006 Long Range Development Plan (LRDP; also referred to herein as the "project" for purposes of CEQA) for Lawrence Berkeley National Laboratory (LBNL; also referred to as "Berkeley Lab," "the Laboratory," or "the Lab" in this document).

An LRDP is a land use plan that guides overall development of a site. The Lab serves as a special research campus operated by the University employees, but it is owned and financed by the federal government and as such it is distinct from the UC-owned Berkeley Campus. As a campus operated by the University of California, the Laboratory is required to prepare an EIR for an LRDP when one is prepared or updated pursuant to Public Resources Code Section 21080.09. The adoption of an LRDP does not constitute a commitment to, or final decision to implement, any specific project, construction schedule, or funding priority. Rather, the proposed 2006 LRDP describes an entire development program of approximately 980,000 gross square feet of new research and support space construction and 320,000 gross square feet of demolition of existing facilities, for a total of approximately 660,000 gross square feet of net new occupiable space for the site through 2025. Specific projects will undergo CEQA review at the time proposed to determine what, if any, additional review is necessary prior to approval. As described in Section 1.4.2, below, and in Chapter 3 of this EIR (the Project Description), the size of the project has been reduced since the Notice of Preparation for this EIR was issued. This reduction was in response to consultation with the City of Berkeley as well as other factors.

CEQA requires that, before a decision can be made by a state or local government agency to approve a project that may have significant environmental effects, an EIR must be prepared that fully describes the environmental effects of the project. The EIR is a public informational document for use by University decision-makers and the public. It is intended to identify and evaluate potential environmental consequences of the proposed project, to identify mitigation measures that would lessen or avoid significant adverse impacts, and to examine feasible alternatives to the project. The information contained in the EIR is reviewed and considered by the lead agency prior to its action to approve, disapprove, or modify the proposed project.

CEQA states that the lead agency (in this case, the University) shall neither approve nor implement a project as proposed unless the significant environmental effects of that project have been reduced to less-than-significant levels, essentially "eliminating, avoiding, or substantially lessening" its expected impacts. If the lead agency approves the project despite residual significant adverse impacts that cannot be mitigated to less-than-significant levels, the agency must state the reasons for its action in writing. This "Statement of Overriding Considerations" must be included in the record of project approval.

This EIR has been prepared to inform The Regents of the University of California ("The Regents"), responsible agencies, trustee agencies, and the public of the proposed project's environmental effects. The EIR is intended to publicly disclose those impacts that may be significant and adverse, describe the possible measures that would mitigate or avoid such impacts, and describe a reasonable range of alternatives to the project.

I.B. Relationship between LBNL, the University, and the U.S. Department of Energy

LBNL is a Federally Funded Research and Development Center, as defined in the Federal Acquisition Regulations and Department of Energy Acquisition Regulations. It is a Government Owned and Contractor Operated Federal Laboratory, funded by the U.S. government to meet specific long-term technical needs that cannot be met by any other single organization. From a contractual standpoint, the University is a Management and Operating (M&O) contractor of LBNL as defined under the U.S. Department of Energy (DOE) Acquisition Regulations (DEARs) – specifically DEAR Part 970. As the Laboratory's M&O Contractor, UC is responsible for providing the intellectual leadership and management expertise necessary and appropriate to manage, operate, and staff the Laboratory; accomplish the missions and activities assigned and funded by DOE to the Laboratory; administer the DOE/UC Prime Contract; and provide UC oversight of the Laboratory's contract compliance and performance. The Prime Contract (Contract 31) provides the overall statement of work to be performed and the terms and conditions of its performance for the federal government. The contract calls for budget and program planning that is coupled to the Department of Energy and its plans and the federal budgeting process.

Funds provided to LBNL by DOE are deposited from the U.S. Treasury into an account that is owned by the federal government under an agreement between the Department of Energy, The Regents of the University of California and the Bank (Union Bank). While the University is authorized to withdraw funds for salaries and other expenses, it does not own the account. All expenses at the Laboratory, drawn from the account, must be consistent with Federal Cost Accounting standards and are audited by the federal government. Consistent with federal guidelines for federal facilities, payments for state and local taxes are not allowable expenses. As a federal organization, the Laboratory operates under federal statutes and regulations and allows for those operational expenses, including those federal requirements (such as environmental permits) delegated to the State and local governments.

The federal government leases land at Berkeley Lab from The Regents and constructs federally owned buildings on the leased lands. Equipment at the Laboratory is also acquired and owned by the federal government. The University's role is to provide the intellectual scientific and management leadership, and to staff and operate the Laboratory as provided in Contract 31 between The Regents and the Department of Energy. With the approval of The Regents, the President appoints the Laboratory Director. The appointment of the Laboratory Directors is also subject to the approval of DOE. The Director is an Officer of the University of California.

Recently DOE has begun encouraging its contractors to assist in providing facilities for the National Laboratories through third-party financing. In this manner, DOE will lease buildings on a site that may have been constructed by other parties. DOE issues a Statement of Mission need for the construction of the facilities, and it enters into lease agreements for the occupancy. The potential physical and environmental scope of any third-party financed facilities within the 202-acre LBNL main hill site is included in the proposed LRDP and this EIR.

Because The Regents may re-acquire full responsibility for the lands should the federal government close the Laboratory, and for effective ongoing management, The Regents hold themselves accountable for the stewardship of the Laboratory within the State of California. The Regents require and approve the University-defined LRDP and require that its approval be consistent with the University's policy that an LRDP undergo CEQA review and approval.

In summary, the role of DOE is to determine the federal research mission and program, provide the funding, and oversee the execution of DOE programs. The Laboratory planning is coupled to DOE and federal program planning guidelines. UC provides the intellectual resources for running the Lab, and oversees its relationship to the University, the community, and its contract compliance with DOE. The LBNL serves as a special research campus operated by University employees, but it is owned and financed by the federal government, and as such it is distinct from the UC-owned Berkeley Campus.

I.C. Project Background

University of California campuses, including LBNL, are required to maintain and periodically update their Long Range Development Plans. An LRDP is a planning document that establishes a general framework and direction for the physical development of an institution over a specific period of time. The University of California further mandates that any new LRDP be accompanied by an EIR pursuant to CEQA. Any new LBNL LRDP and EIR must be approved by The Regents of the University of California before the LRDP can be implemented. At that time, the Draft LRDP would be published as a final LRDP.

LBNL's existing LRDP and EIR were approved in 1987. The EIR was updated by a Supplemental EIR in 1992 and an Addendum in 1997. Sufficient time has passed that a renewed statement of planning vision is appropriate for Berkeley Lab as it works to address national scientific challenges and research opportunities at the beginning of this new century.

I.D. Summary of Proposed Project

I.D.1 Existing Conditions Baseline

The Lab occupies approximately 100,000 square feet of off-site space at the UC Berkeley campus and approximately 338,000 gsf of other off-site leased spaces, mostly in Berkeley, Oakland, and Walnut Creek. (The Regents also own the Lab-occupied land at UC Berkeley; other off-site space is leased from private landowners.) The Regents do not own, but lease and control, along with DOE, the approximately 338,000 square feet of LBNL space leased on the commercial market off of the main LBNL hill site.

The LBNL site is a developed area that lies between UC Berkeley and residential neighborhoods of the City of Berkeley to the west and northwest. The UC Berkeley corporation yard, UC Berkeley recreation pools, sports fields, and walking trails, the UC Berkeley–managed Ecological Study Areas and the UC Berkeley Botanical Garden lie to the south, southeast, and east; and UC Berkeley–operated research and educational facilities lie to the northeast. Although developed, the LBNL site retains substantial vegetation and natural topographic features.

The Laboratory's total adjusted daily population (ADP) at all locations is projected to increase from the current 4,375 to 5,375.[1] This EIR considers the effects of both maintaining current levels of off-site space and population, and of accommodating most off-site population back onto the hill site.

Since LBNL last updated its LRDP in 1987, Berkeley Lab has increased in size from 134 acres to 202 acres, primarily due to the transfer of management responsibility for Regents' land that had been previously managed by UC Berkeley. These transfers were arranged to allow Berkeley Lab to implement a fuel management program that reduces risks of building damage from wildland fire, to facilitate more effective overall management of The Regents' land in this area, and to support the orderly development of the Laboratory site. Berkeley Lab currently manages these additional lands under guidance of UC Berkeley's LRDP and will manage the lands in accordance with the 2006 LRDP, pending approval of the Laboratory's 2006 LRDP and EIR.

The CEQA Guidelines (Section 15125) require that an EIR describe the environmental conditions in the project vicinity as they existed at the time the Notice of Preparation (NOP) for the project was published. The Guidelines state that "this environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." LBNL issued the NOP for the proposed LRDP on October 28, 2003, and therefore this EIR uses 2003 as the baseline year for evaluating the project's impacts on its environmental setting. To provide a conservative analysis, however, this EIR selectively uses more recent (post-2003) data, where appropriate and where using such data does not make the analysis less conservative.

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1 The ADP calculation includes the Lab's full-time-equivalent employment plus 40 percent of annual guests, an estimate of the population present on any given day based on historic surveys. The percentage of guests who are on-site will be periodically reviewed and the ADP guest factor periodically updated during the term of the LRDP.

I.D.2 Proposed Project

The proposed project is the adoption and implementation of the proposed LBNL 2006 LRDP. The Draft LRDP was published concurrently with this EIR in January 2007 and is incorporated by reference into this EIR. The proposed 2006 LRDP has been publicly circulated in January 2007 with this EIR.

The primary purpose of the LRDP is to guide the physical development of land and facilities and to provide a framework for implementing the Laboratory's mission and scientific goals. The proposed LRDP sets forth plans and policies that are intended to guide the physical development of the LBNL hill site, including the construction of new buildings, roads, parking lots, and infrastructure systems, while protecting significant natural resources at the site.

LBNL currently occupies and uses space on its main hill site, on the UC Berkeley campus, and in various leased locations in the cities of Berkeley, Oakland, Walnut Creek, and elsewhere. The proposed 2006 LRDP addresses continuing and projected uses and activities at all three of these areas. The baseline figures used in this document were established in July 2003.[2] Space area and square footage numbers used in this description include occupied buildings and associated mechanical structures; space figures do not include parking structures or electrical switch-gear structures.

> **Main Hill Site:** Under the proposed LRDP, the total building area at the main LBNL hill site could increase from 1.76 million gross square feet (gsf) of occupiable space to as much as 2.42 million gsf of occupiable space, for an overall increase over the life of the LRDP of 660,000 net new gsf. This EIR analysis also analyzes parking structure options in various hill site locations – these are not included in the 660,000 gsf of net new occupiable space. The net total assumes demolition of up to 320,000 gsf of existing facilities during the term of the LRDP (of this total, approximately 50,000 gsf has already been demolished since July 2003, which is the baseline period for this analysis). Without factoring in demolition, the total anticipated project-related construction at the main hill site is estimated to be approximately 1.35 million gsf over the planning period, including 372,000 gsf of new parking structures.
>
> For purposes of the analysis in this EIR, the maximum total of new construction and renovation is 1.35 million square feet. This includes 980,000 gsf of new occupiable building space (research and support space) construction, along with 372,000 gsf of new parking structures. While parking structures are not considered part of the occupiable space totals identified in the LRDP, they do account for potential construction-related impacts and are thus considered in the EIR analysis. When the projected demolition figure of 320,000 gsf is subtracted from the new occupiable building space total, the net amount of possible new construction under the LRDP – 660,000 net new gsf – is derived.

2 Pursuant to the CEQA Guidelines (Section 15125(a)), the baseline date for environmental impact analysis is the date upon which the notice of preparation for this EIR was circulated. Due to the substantial time required to prepare this EIR, some of the activities have already been either approved or completed pursuant to the Laboratory's existing LRDP and appropriate CEQA compliance.

Readers should note that the scope of potential development on the main hill site has been reduced since the issuance of the Notice of Preparation for this EIR. The NOP anticipated a possible maximum of 1,240,000 gsf of new research and support space construction, and 440,000 gsf of demolition, leading to up to 800,000 net new gsf of occupiable space. Since the release of the NOP, however, it has become apparent to Lab staff that DOE funding priorities may limit the scope of development pursuant to the LRDP, and while it is possible that other funding sources may make up some of this difference, this reallocation of DOE priority is likely to decrease the amount of development on the main hill site. In addition, and more importantly, substantial concerns were raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed on the main hill site. For both of these reasons, the Lab determined that the LRDP and the proposed project presented in this EIR should be reduced in scope to 980,000 gsf of new occupiable building space construction, with 320,000 gsf of demolition for a net total of 660,000 gsf of new occupiable space. This is a reduction of approximately 21 percent in the amount of possible new construction of occupiable space under the LRDP, and a reduction of 17.5 percent in the amount of possible net new occupiable space. Table I-1 summarizes this reduction in development potential, showing the total occupiable building space and adjusted daily population (ADP) proposed by the 2006 LRDP currently proposed as compared to the occupiable building space and ADP provided for by the LRDP that was originally proposed when the NOP was issued. Table I-2 shows the corresponding reduction in the number of parking spaces proposed for the main hill site under the currently proposed 2006 LRDP.

UC Berkeley Campus: Berkeley Lab has a long-standing history of use of approximately 100,000 net square feet (nsf) on the UC Berkeley campus. The LRDP does not project an increase in Berkeley Lab space beyond 100,000 nsf, but allows for reallocation of space into other buildings on the UC Berkeley campus.

Off-Site Leased Space: Currently, the Laboratory uses approximately 338,000 gsf of off-site commercial leased space for shipping, receiving and warehouse functions; administrative work in Washington D.C.; telecommute centers; and research projects that are site dependent and/or joint ventures with other laboratories. The LRDP anticipates that the Laboratory will continue to use off-site leased space for these purposes, though the amount and location of such space will change over time, depending on Laboratory needs and market conditions. However, for analysis in this EIR, the total amount of off-site leased space is not expected to substantially differ from the current level.

I.D.3 Project Variant

Berkeley Lab may decide during the course of the planning period to consolidate most of its personnel on the main hill site. Under this variant, only a few LBNL staff would work off-site, including warehouse staff and personnel based in Washington, D.C., for a total of approximately 25 people. Under the variant, new space developed on the main hill site would remain the same as under the proposed 2006 LRDP, although some administrative office space may be used more intensively, nor would the number of parking spaces provided to Laboratory employees be increased to accommodate this additional hill staff.

TABLE I-1
ADJUSTED DAILY POPULATION AND TOTAL BUILDING SPACE
ORIGINALLY PROPOSED 2006 LRDP VS. CURRENTLY PROPOSED 2006 LRDP

	Originally Proposed 2006 LRDP	Currently Proposed 2006 LRDP	Difference
Adjusted Daily Population (ADP)			
LBNL Hill Site	4,800	4,650	-150
UC Berkeley Campus	350	350	0
Leased Space[1]	375	375	0
Total Lab Population	**5,525**	**5,375**	**-150**
Total Building Space (gsf)			
LBNL Hill Site	2,560,000	2,420,000	-140,000
UCB Campus Space (nsf) [2]	100,000	100,000	0
Leased Space[1]	338,000	338,000	0
Total Occupied Space	**2,998,000**	**2,858,000**	**-140,000**

gsf – gross square feet; nsf – net square feet

1 "Leased space" includes the Lab's warehouse in west Berkeley, and leased office and research space in downtown and other areas of Berkeley, downtown Oakland, Walnut Creek, and various other locations. See text.

2 Space occupied by LBNL on the UC Berkeley campus is variable; the amount of space in the table is the maximum that LBNL uses.

TABLE I-2
PROPOSED PARKING PROGRAM
ORIGINALLY PROPOSED 2006 LRDP VS. CURRENTLY PROPOSED 2006 LRDP

	Originally Proposed 2006 LRDP	Currently Proposed 2006 LRDP	Difference
2003 Baseline Parking Spaces	2,300	2,300	0
2003 Baseline Adjusted Daily Population (ADP)	4,375	4,375	0
2003 Baseline ADP to Parking Ratio	1.9	1.9	0
Anticipated Additional Spaces	600	500	-100
Total Planned Spaces	**2,900**	**2,800**	**-100**
Future ADP	5,525	5,375	-150
Future ADP to Parking Ratio	1.9	1.9	0
2003 Baseline Parking Spaces	2,300	2,300	0
Spaces to be removed	(990)	(800)	190
New spaces to be added in lots	470	450	-20
New spaces added in structures	1,120	850	-270
Total spaces per plan	**2,900**	**2,800**	**-100**

I.D.4 Illustrative Development Scenario

The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. The Lab has developed the scenario to provide greater detail and more complete public disclosure of potential project impacts, and also to provide a basis for some of the quantified modeling that has been completed for the LRDP. The scenario is intended to provide a conservative basis for the analysis of environmental impacts. It is anticipated that actual development that would be approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. In addition, the Illustrative Development Scenario was developed before the proposed 2006 LRDP was reduced in scope, as described in Section I.D.2 above, in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. At any particular building site, however, the level of development may approach the intensity of development that is included in the scenario (and portrayed in the analyses such as visual renditions that are based on the scenario), so the scenario remains an appropriate and conservative basis for evaluating the potential environmental impacts of development pursuant to the 2006 LRDP. Also, the actual locations of buildings, configurations, uses, and the like may vary as specific projects are considered and approved in the future.

I.E. Summary of Alternatives

This Draft EIR analyzes four alternatives to the proposed 2006 LRDP: a No Project Alternative (as required by CEQA), two reduced project alternatives, a preservation alternative, and an off-site alternative. Additionally, a Preservation Alternative and a No Growth Alternative were considered and rejected; the explanation is given in Chapter V.

I.F. California Environmental Quality Act Process

I.F.1 Organization of this Draft Environmental Impact Report

This EIR is organized to allow the reader to quickly review a summary of the analysis and recommended mitigation measures, and identify the residual environmental impacts after mitigation, if any (see Chapter II, Summary). Those readers who wish to read the Draft EIR in greater detail are directed to Chapter IV, Environmental Setting, Impacts, and Mitigation Measures.

The Draft EIR begins with this Introduction (Chapter I). The chapters following the Introduction are organized as follows:

Chapter II, Summary, describes the proposed project, issues of controversy associated with the project, environmental effects of the project, and alternatives to the project (including the No Project Alternative). The Summary includes Table II-1, Summary of Environmental Impacts and Mitigation Measures, which lists each identified environmental impact, corresponding mitigation measure(s), and residual level of significance following implementation of mitigation.

Chapter III, Project Description, provides a description of the project site and location, project objectives, proposed project characteristics, and an outline of the approval process.

Chapter IV, Environmental Setting, Impacts, and Mitigation Measures, contains an analysis of environmental topics. The discussion of each topic is divided into an *introductory paragraph* that describes the scope of the issue under consideration, a *Setting* section that describes baseline environmental information, an *Impacts and Mitigation Measures* section that sets forth general standards of significance for potential impacts and describes the project-specific impacts and mitigation measures, and a *Cumulative Impacts* section that describes the cumulative impacts, if any, of the proposed project, in conjunction with other applicable projects.

Chapter V, Alternatives, provides an analysis of a reasonable range of alternatives to the proposed project. As required by the CEQA Guidelines, a discussion of the reasons for selecting the alternatives analyzed in this chapter is provided, along with a comparative analysis of each alternative and identification of the "environmentally superior" alternative.

Chapter VI, CEQA Considerations, reviews the significant, irreversible effects (if any) and cumulative impacts identified in Chapter IV.

Chapter VII, Report Preparation, lists the firms and staff members that prepared the Draft EIR, as well as persons and agencies contacted during preparation of the Draft EIR.

Chapter VIII, Bibliography, provides a list of documents cited in the EIR.

Chapter IX, Acronyms, presents a list of acronyms and abbreviations used in the EIR.

The **Appendices** present the background data and technical information used in support of the impact analyses provided in the EIR.

I.F.2 Environmental Review Process

On October 28, 2003, LBNL issued a Notice of Preparation (NOP) to governmental agencies, organizations, and interested persons for the 2006 LRDP. The NOP is included as an appendix to this EIR, as are comments on the scope of the EIR received in response to the NOP, and comments on the proposed content of the EIR received at a public scoping meeting held at the North Berkeley Senior Center on November 17, 2003. Comments received regarding the proposed content of the EIR are addressed in this Draft EIR. A transcript from that meeting is included in Appendix A.

This Draft EIR will be published and circulated for review and comment by the public and other interested parties, agencies, and organizations for a 60-day period. **The public review period will be from January 22, 2007 to March 23, 2007. A public hearing on the Draft EIR will be held from 6:30 p.m. to 9:30 p.m. on Monday, February 26, 2007, at the North Berkeley Senior Center. The North Berkeley Senior Center is located at 1901 Hearst Avenue in Berkeley.**

The public is invited to attend the hearing and to offer comments on the Draft EIR. All comments or questions about the Draft EIR should be addressed to:

> Jeff Philliber
> Environmental Planning Group
> Lawrence Berkeley National Laboratory
> One Cyclotron Road, MS 90J-0120
> Berkeley, CA 94720

Comments may also be sent by e-mail to: lrdp-eir@lbl.gov (attention: Jeff Philliber).

The 2006 LRDP and this Draft EIR are also publicly available at www.lbl.gov/lrdp (for the duration of this CEQA process) and also at the following locations:

> Berkeley Lab Main Library
> One Cyclotron Road
> Building 50, Room 4034
> Berkeley, CA 94720

> Berkeley Public Library
> 2090 Kittredge Street
> 2nd Floor, Reference Desk
> Berkeley, CA 94704

Following the public review period, responses to all substantive comments received on the adequacy of the Draft EIR and submitted within the specified review period will be prepared and included in the Final EIR. The Regents will then review and consider the Final EIR prior to any decision to approve, revise and approve, or reject the proposed project. Prior to approval of the proposed project by The Regents, the University must certify the Final EIR as complete and adequate and adopt a Mitigation Monitoring Program. Project requirements and required mitigation measures identified in the EIR and Mitigation Monitoring Program adopted by The Regents shall be implemented by LBNL.

I.F.3 Evaluation of Local Plans and Zoning in this EIR

The State of California and its constitutionally created agencies are generally exempt from a city's planning and zoning regulations. Specifically, the University of California was established by Article IX, Section 9 of the California Constitution. Section 9 grants the UC Regents broad authority with respect to the management and disposition of its property: "The Regents of [UC] . . . shall have the power to take and hold . . . without restriction, all real and personal property for the benefit of the university or incidentally to its conduct." CAL. CONST. Art. IX, Section 9(f). Because the Lab is operated by the UC on UC land for UC purposes, it is exempt from local zoning regulations pursuant to its Section 9 grant of sovereignty.

LBNL is a federal facility conducting work within the University of California's mission and as such is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible.

The CEQA Guidelines (Section 15125(d)) specify that an EIR shall discuss "any inconsistencies between the proposed project and applicable general plans and regional plans." The general plans of the Cities of Berkeley and Oakland are not "applicable" plans, because UC is legally exempt from such plans and those plans do not apply to the conduct of university activities on UC property. In addition, the conduct of federal activity is not subject to such local plans. Nevertheless, for purposes of public disclosure this EIR at appropriate points does summarize the provisions of local land use plans for CEQA purposes. Also, Section 3.14 of the UC CEQA Guidelines states that UC will seek to cooperate to minimize conflict with local plans where feasible to do so.

I.F.4 Relationship Between this EIR and CEQA Review for Later Project Approvals Pursuant to the LRDP

The 2006 LRDP is a land use plan that guides the physical development of the LBNL main site. It is not an implementation plan, and adoption of the LRDP does not constitute a commitment to any specific project, construction schedule, or funding priority. Rather, it describes the entire development program including construction of approximately 660,000 net new occupiable gsf for the site through 2025. The 2006 LRDP EIR is a program-level EIR that evaluates the effects of implementation of the entire LRDP. Any proposal for future development at LBNL must be approved by the LBNL Director, by the President of the University of California, or The Regents, as appropriate, and comply with CEQA.

Additional future LBNL projects proposed for implementation under the 2006 LRDP would be evaluated to determine whether the LRDP EIR has fully analyzed the project impacts, or whether additional CEQA review is necessary.

As a program CEQA document, the LRDP EIR sets standards of significance for environmental impacts and evaluates whether construction and operation of Berkeley Lab through 2025 would exceed these standards. Under CEQA guidelines for using program EIRs with later activities, if the proposed activities do not have effects that were not examined in the previous program EIR, and no new or substantially more severe significant effects would occur and no new mitigation measures would be required, a program EIR has adequately analyzed the later activities for CEQA purposes; i.e., the later activities are within the scope of the program EIR, and no further review under CEQA is required.

Use of program EIRs to cover later activities is addressed in CEQA Guidelines Section 15168(c):

(c) Use with Later Activities. Subsequent activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.

> (1) If a later activity would have effects that were not examined in the program EIR, a new Initial Study would need to be prepared leading to either an EIR or a Negative Declaration.

(2) If the agency finds that pursuant to Section 15162, no new effects could occur or no new mitigation measures would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required.

(3) An agency shall incorporate feasible mitigation measures and alternatives developed in the program EIR into subsequent actions in the program.

(4) Where the subsequent activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were covered in the program EIR.

(5) A program EIR will be most helpful in dealing with subsequent activities if it deals with the effects of the program as specifically and comprehensively as possible. With a good and detailed analysis of the program, many subsequent activities could be found to be within the scope of the project described in the program EIR, and no further environmental documents would be required.

Like many other CEQA Guidelines sections, Section 15168 includes interpretive “discussion” that has been prepared by the Governor’s Office of Planning and Research in connection with the promulgation of the Guidelines. This interpretive discussion is considered an advisory aid in interpreting the Guidelines. The discussion that accompanies CEQA Guidelines Section 15168 indicates that the use of program EIRs to cover later activities is favored under CEQA when such EIRs fulfill the conditions set forth in Section 15168:

> Use of the program EIR also enables the Lead Agency to characterize the overall program as the project being approved at that time. Following this approach when individual activities within the program are proposed, the agency would be required to examine the individual activities to determine whether their effects were fully analyzed in the program EIR. If the activities would have no effects beyond those analyzed in the program EIR, the agency could assert that the activities are merely part of the program which had been approved earlier, and no further CEQA compliance would be required. This approach offers many possibilities for agencies to reduce their costs of CEQA compliance and still achieve high levels of environmental protection.

Future activities at LBNL that would be implemented under the LRDP will be examined by the Lab under this program EIR to determine whether additional CEQA documentation must be prepared. As provided under CEQA Guidelines Sections 15162 and 15168, if the Lab finds, among other things, that no new effects would occur as a result of the project beyond what is evaluated in this EIR and that no new mitigation measures would be required, the Lab could approve the activity as being within the scope of the project covered by this EIR, and no new environmental documentation would be needed. As outlined in Guidelines Section 15164, if the above conditions apply, but some changes or additions to the EIR are necessary, an addendum to the EIR could be prepared. If these conditions do not apply—for example, if the Lab finds that a later activity would have effects that were not examined in the EIR—a new Initial Study and/or an EIR may have to be prepared. Also, for projects that require additional CEQA review and documentation before approval, this EIR may be used as a first-tier document pursuant to CEQA Guidelines Section 15152. In some circumstances (Guidelines Sections 15300 et seq.), a future activity may be subject to a specific exemption from CEQA. The Lab will use a written checklist or similar device to document the evaluation of the activity to determine whether the environmental effects of the operation are covered in the EIR.

Review of future projects is subject to two additional restrictions, both of which are primarily the result of consultations with the City of Berkeley regarding overall growth at the Lab and traffic impacts of such growth. The first restriction is consistent with the reduced scope of the LRDP and the proposed project as described in this EIR. The proposed LRDP was reduced from an initial proposal, reflected in the Notice of Preparation, for 1,240,000 gross square feet of new research and support space construction and 440,000 square feet of demolition for a total of 800,000 square feet of net new occupiable space, to the currently proposed LRDP which consists of 980,000 gross square feet of new research and support space construction and 320,000 square feet of demolition, for a total of 660,000 gross square feet of new occupiable space. Accordingly, any development in excess of a net total of 980,000 gross square feet of new occupiable (research and support) space construction or 320,000 gross square feet of demolition would require an amendment of the LRDP and accompanying CEQA review. Absent such an amendment and the accompanying additional CEQA review, this EIR will not be used as a first-tier EIR for, or to reduce or streamline the subsequent CEQA processing of, any project that, when added to other construction pursuant to the LRDP, exceeds a net total of 980,000 gross square feet of new research and support space construction or 320,000 gross square feet of demolition.

Second, pursuant to a “reopener” that has been negotiated with the City of Berkeley, an updated traffic analysis will be prepared, on the earliest to occur of ten years from the date that this EIR is certified or the date upon which development at the Lab pursuant to the LRDP reaches 375 net new parking spaces. This updated traffic analysis will be prepared as part of an overall transportation demand management (TDM) program that has been developed in consultation with the City of Berkeley. Implementation of that TDM program is included in this EIR as a recommended mitigation measure for traffic impacts. When the earliest of these thresholds is reached, the Lab will conduct a new traffic study, consult with the City of Berkeley regarding the results of that study, and consider whether further mitigation measures or modification to the LRDP should be adopted based upon that traffic study. For example, when the Lab begins the CEQA review for a project that would result in the construction of parking spaces that would cause the Lab to exceed 375 net new spaces, the Lab would conduct an overall traffic study prior to the approval of that project’s CEQA document. Alternatively, the Lab may initiate a free-standing traffic study ten years after this EIR is certified. Thus, the further traffic study may be conducted as a part of a further project review or as an independent, free-standing study. If this traffic study indicates that the traffic analysis and mitigation in this EIR are still appropriate for the review of future projects, then the Lab will continue to rely upon the traffic analysis in this EIR as a first-tier analysis of traffic impacts. If this traffic study indicates that further mitigation is required, then the addition of that recommended mitigation will be considered by the Lab in consultation with the City of Berkeley.

CHAPTER II
Summary

This summary presents an overview of the analysis contained in Chapter IV: Environmental Setting, Impacts, and Mitigation Measures. This chapter summarize the following: 1) areas of controversy; 2) project impacts; and 3) mitigation measures for significant impacts. Alternatives to the project are analyzed in Chapter V.

2.1 Project Description

This EIR evaluates the adoption and implementation of the proposed Lawrence Berkeley National Laboratory 2006 Long Range Development Plan (2006 LRDP; also referred to herein as the CEQA "project") through a horizon year of 2025. Lawrence Berkeley National Laboratory (LBNL; also referred to herein as the "Lab," "Berkeley Lab," and "Laboratory") occupies 202 acres in the Oakland/Berkeley hills, on what is referred to in the EIR as the Lab's main "hill site." The proposed LRDP provides for construction of approximately 980,000 gross square feet (gsf) of additional research and support space, approximately 585,000 square feet of parking space (of which an estimated 372,000 square feet [64 percent] would be in parking structures for a net gain of 500 new parking spaces), and demolition of up to 320,000 gsf of building space that is or may become obsolete or that poses safety hazards.[1] Up to 600,000 gsf of renovation may take place to restore or rehabilitate existing buildings.

The scope of the proposed 2006 LRDP and the amount of potential development under that LRDP have been reduced since the issuance of the Notice of Preparation for this EIR. The NOP anticipated a possible maximum of 1,240,000 gsf of new research and support space construction, and 440,000 gsf of demolition, leading to up to 800,000 net new gsf of occupiable space. Since the release of the NOP, however, it has become apparent to Lab staff that U.S. Department of Energy (DOE) funding priorities may limit the scope of development pursuant to the LRDP, and while it is possible that other funding sources may make up some of this difference, this reallocation of DOE priority is likely to decrease the amount of development on the main hill site. In addition, and more importantly, substantial concerns were raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed under the LRDP. For both of these reasons, the Lab determined that the LRDP and the proposed project presented in this EIR should be reduced in scope to 980,000 gsf of new occupiable building space construction, with 320,000 gsf of demolition, for a net total of 660,000 gsf of new occupiable space. This is a reduction of

1 Of the total of 320,000 gsf, approximately 50,000 gsf has already been demolished under the existing LRDP 1987 LRDP since the July 2003 baseline date for this document and approximately 270,000 gsf is projected to be demolished over the term of the approved LRDP.

approximately 21 percent in the amount of possible new construction of occupiable space under the LRDP, and a reduction of 17.5 percent in the amount of possible net new occupiable space.

LBNL may attempt to consolidate most of its staff and operations on its main hill site. A "project variant," in which most of LBNL's off-site staff would be moved onto the main hill site during the planning period, is analyzed in this EIR concurrent with the analysis of the 2006 LRDP.

The LRDP contains descriptions of Berkeley Lab science and technology goals and development principles for site and facilities development. In addition, a separate, companion document, the Berkeley Lab Design Guidelines, will provide direction for physical development under the 2006 LRDP. These Design Guidelines are proposed to be adopted by the Lab following The Regents approval of the LRDP.

The University of California is exempt under Article 9, Section 9 of the State Constitution from local planning, zoning, and redevelopment regulations whenever land under its control is used for purposes within its mission. As a federal facility—a U.S. Department of Energy National Laboratory—Lawrence Berkeley National Laboratory is also exempt from local planning, zoning, and redevelopment regulations.

2.1.1 Baseline Site Conditions and Characteristics

The LBNL site is a developed area that lies between UC Berkeley and residential neighborhoods of the City of Berkeley to the west and northwest. Although developed, the LBNL site retains substantial vegetation and natural topographic features. Approximately one-third of the LBNL site is covered by impervious surfaces, including buildings, roads, and parking lots, while the remaining two-thirds of the site is pervious or otherwise not paved. Berkeley Lab is fenced for security and controlled access.

The main hill site is owned by The Board of Regents of the University of California ("The Regents" or "UC Regents"). Building parcels on the Lab's hill site are leased by the University to the U.S. Department of Energy (DOE) for all major DOE constructed buildings. The DOE owns most of the facilities and structures within LBNL and contracts out the management and operation of the National Laboratory to the University. The Lab also occupies approximately 100,000 square feet of off-site space at the UC Berkeley campus and approximately 338,000 gsf of other off-site leased spaces, mostly in Berkeley, Oakland, and Walnut Creek. (The UC Regents also own the Lab-occupied land at UC Berkeley; other off-site space is leased from private landowners.) Under the proposed LRDP, no substantial growth of either lab-occupied space on the UC Berkeley campus or of commercial lease space is planned, although the campus buildings occupied and off-site locations leased may change over time.

LBNL's research and support activities are conducted in structures occupying a total of 2.2 million square feet, of which approximately 1.76 million square feet are located on the main hill site. The hill site has more than 150 buildings, many originally built as "temporary" single-purpose structures, more than 60 percent of which are more than 40 years old.

Under baseline (2003) conditions, LBNL employed approximately 3,800 people, including about 1,400 scientists and engineers, 500 administrative staff, and 1,900 technical and support staff. An estimated 2,500 guest researchers visit LBNL each year. This translates into an adjusted daily population (ADP)[2] of approximately 4,375. Of this total, some 4,000 are on the main hill site and in laboratory space on the UC Berkeley campus.[3] Research staff in leased space in downtown Oakland and in Walnut Creek constitute an ADP of approximately 100 (about 50 at each location), and administrative staff in leased office space in downtown Berkeley constitute an ADP of about 225. About 50 ADP represent research staff who work in other remote locations.

Vehicular access to the main hill site occurs primarily along two routes: Hearst Avenue and Centennial Drive. These roadways provide access to three controlled points of entry (Blackberry Canyon Gate on Cyclotron Road, Strawberry Canyon Gate on Centennial Drive, and Grizzly Peak Gate on Centennial Drive), all of which are staffed by security personnel. Additional pedestrian access is provided through additional pedestrian-only gates. Circulation within the Lab site is primarily via two east-west roadways and connecting north-south roadways (Chamberlain Road and McMillan Road make up the primary “upper route” and Lawrence and Alvarez Roads form the “lower route”). Accompanying pathways and a series of connecting roadways, paths, stairways, and elevators allow staff and visitors to move among the Lab’s buildings. The main hill site provides approximately 2,300 permit parking spaces to qualifying Lab personnel and guests. LBNL operates a free shuttle service for employees and visitors both on the hill site and off-site between LBNL, UC Berkeley, the downtown Berkeley and Rockridge BART stations, and AC Transit.

The Laboratory’s principal role for the DOE is to promote fundamental science, including developing powerful experimental and computational systems for exploring properties of matter, deepening understanding of molecular interactions and synthesis, and gaining insights into biological molecules, cells, and tissues. The Laboratory is a major contributor of research on energy resources, including efficient energy use, the earth’s structure and energy reservoirs, fusion, and cleaner combustion of fuels, as well as environmental research, subsurface contaminant transport, bioremediation, and indoor air quality. Research programs include computational research, information technologies, chemical sciences, materials sciences, physical biosciences, earth sciences, life sciences, accelerator and fusion research, nuclear science, and basic physics. User facilities include the Advanced Light Source, National Energy Research Scientific Computing Center, National Center for Electron Microscopy, and Energy Sciences Network (ESnet). The Laboratory’s multidisciplinary research environment and unique location serve to strengthen partnerships with industry, universities, and government laboratories. Partnerships include the Joint Genome Institute and programs in advanced accelerator and detector systems, x-ray lithography, high-speed networking and computer architectures, building and lighting systems, and science education.

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[2] ADP represents the actual number of people at the Laboratory’s main hill site, in Berkeley Lab space on the UC Berkeley campus, and in leased facilities on any given day. It is calculated by combining the Lab’s full-time-equivalent employment (about 3,400) with approximately 40 percent of the annual average number of guests.

[3] Under baseline conditions, about 3,650 ADP are on the main hill site and about 350 ADP are on the UC Berkeley campus. Many LBNL staff working at UC Berkeley hold “joint appointments” at both institutions.

2.1.2 Changes in Baseline Conditions Since 2003

LBNL issued the Notice of Preparation (NOP) for the proposed LRDP on October 28, 2003, and therefore this EIR uses 2003 as the baseline year for evaluating the project's impacts on its environmental setting. To provide a conservative analysis, however, this EIR selectively uses more recent (post-2003) data, where appropriate and where using such data does not make the analysis less conservative. Since the NOP was issued, the Lab's ADP peaked at approximately 4,650 in 2004 and has since declined to about 4,515 in 2006. This short-term change in ADP is considered to be a part of the normal fluctuation in the Lab's population cycle and, for purposes of impact analysis, has not resulted in a meaningful change, compared with the 2003 baseline setting.

Also since the NOP was issued, the Lab has considered a number of building projects that, for purposes of this EIR, are included as part of the 2006 LRDP "project." The Molecular Foundry was approved and has been constructed and began preliminary operations in early 2006.[4] Although operational, the Molecular Foundry is included as part of the 2006 LRDP "project" that is analyzed in this EIR, because the building was not operating when the EIR analysis was begun in 2003. Berkeley Lab has also approved construction of the Animal Care Facility, a 7,100-gross-square-foot structure that will house mice used in research. Construction of this project is under way and is expected to be complete in 2007. In addition, certification of an EIR and approval of the demolition of Building 51 (the Bevatron) are anticipated to be considered in early 2007; the Building 51 complex is considered part of the baseline setting for this EIR, however, because the buildings were in place when the EIR analysis was begun. Therefore, demolition of Building 51, although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP. Building space for two other planned projects under consideration – the Guest House and the User Support Building – is also included as part of the 2006 LRDP evaluated in this EIR. However, it is anticipated that these projects will undergo separate CEQA analysis pursuant to the 1987 LRDP and the 1987 LRDP EIR, as amended. In addition, two additional projects anticipated to be considered in the future pursuant to the 2006 LRDP EIR are included as part of the reasonably foreseeable future development that is evaluated in this EIR. These projects are the Computational Research and Theory (CRT) Building and the Helios Research Facility. The CRT Building would likely be a six-story, 165,000-gross-square-foot building for high-end computing near the Blackberry Canyon Gate. The Helios facility would likely be proposed as a four-story, 100,000-gross-square-foot laboratory building constructed south of existing LBNL Buildings 66 and 62 or in a location west of Buildings 72 and 67.

2.1.3 Project Objectives

The proposed 2006 LRDP outlines the following approach to revitalizing the facilities and infrastructure at the main site:

- Strengthen and expand existing research programs to sustain and grow Berkeley Lab's role as a national research institution;

4 The Molecular Foundry was approved pursuant to the Lab's existing 1987 LRDP and 1987 LRDP EIR, as amended; a project-specific Negative Declaration was also completed.

- Expand partnerships and collaborations to enhance Berkeley Lab's scientific and technical base;
- Provide flexibility to return staff from its off-site facilities leased in Berkeley and Oakland to the main site in order to enhance collaboration, productivity, and efficiency;
- Expand the capacity of existing high-demand advanced facilities and provide broader functionality;
- Rehabilitate facilities that have outlived their intended purpose and can be cost-effectively adapted for use in new regions of scientific discovery;
- Replace single-purpose facilities with new facilities programmed to accommodate multiple disciplines with advanced infrastructure suitable for future scientific endeavors; and
- Construct new scientific facilities to support future research initiatives and continued growth in existing programs.

The 2006 LRDP also includes a number of principles and strategies intended to guide future development at the Lab. As already noted, a separate, companion document, the Berkeley Lab Design Guidelines, will provide direction for physical development under the 2006 LRDP. These proposed Design Guidelines are proposed to be adopted by the Lab following The Regents approval of the LRDP. These principles, strategies, and design guidelines are listed in Appendix B and are referred to in the Project Description and the various technical sections of this EIR, as appropriate.

2.1.4 Proposed Project

The proposed 2006 LRDP is a new plan that would replace the existing 1987 LRDP, as amended, and address continuing and projected uses and activities at the main LBNL site, at space on the UC Berkeley campus, and at off-site leased locations, assuming a horizon year of 2025. Under the proposed LRDP, the total research and support space building area at the main LBNL hill site would increase to as much as 2.42 million square feet, and the ADP would increase from 4,375 to 5,375 (see Table S-1).

2.1.4.1 Land Use Plan

The 2006 LRDP includes a Land Use Plan that would establish four land use zones for the Lab's hill site. In conjunction with the LBNL Design Guidelines and land use objectives and with avoidance of fixed land use constraints (such as important habitat or seismic zones), the Land Use Plan would guide siting decisions for future buildings and support facilities. The four proposed land use zones are (1) Research and Academic, (2) Central Commons, (3) Support Services, and (4) Perimeter Open Space.

The Research and Academic zone would include approximately 121 acres, largely encompassing or adjacent to already developed portions of the main hill site. Within this area all typical Lab research facilities as well as supporting uses such as parking, circulation and administrative uses would be located. Research space would include laboratories, offices, and specially outfitted

TABLE S-1
BASELINE AND FUTURE POPULATION AND SPACE PROJECTIONS (approx.)

	Baseline (2003)	Future (2025)	Change (2025)
Adjusted Daily Population (ADP)			
LBNL Hill Site	3,650	4,650	+1,000
UC Berkeley Campus	350	350	0
Leased Space[1]	375	375	0
Total Lab Population	**4,375**	**5,375**	**+1,000**
Building Space (gsf)			
LBNL Hill Site	1,760,000	2,420,000	+660,000[2]
UCB Campus Space (nsf)[3]	100,000	100,000	0
Leased Space[1]	338,000	338,000	0
Total Occupied Space	**2,198,000**	**2,858,000**	**660,000**

gsf – gross square feet; nsf – net square feet

1 "Leased space" includes the Lab's warehouse in west Berkeley, and leased office and research space in downtown and other areas of Berkeley, downtown Oakland, Walnut Creek, and various other locations. See text above.

2 Change in building space is net value:320,000 gsf of demolished space subtracted from overall space construction figure of980,000 gsf would result in 660,000 gsf of new space. Two projects—the Molecular Foundry and Building 49—have been approved under the 1987 LRDP and LRDP EIR. The Molecular Foundry has since been constructed, but Building 49 is indefinitely on hold. For purposes of analysis, the Molecular Foundry—approximately 95,000 gsf—is counted as part of the project to be developed and not as part of the baseline setting.

3 Space occupied by LBNL on the UC Berkeley campus is variable; the amount of space in the table is the maximum that LBNL uses.

areas such as accelerator facilities. Research space would also include associated support activity. Under the LRDP, priority would be given to siting new facilities where service infrastructure and roads are in place.

As a subset of the Research and Academic zone, the Central Commons would be the main location of dining and gathering uses, as well as visitor accommodations. This approximately six-acre "heart" of the Lab would be the hill site's primary gathering and event area.

The Support Services zone (19 acres) would provide a central location for the Lab's support functions, such as shops, environmental services, corporation yards, and maintenance. Facilities maintenance and other operations and logistical spaces would provide for operating, maintaining, and repairing the Lab's buildings and grounds.

The 56-acre Perimeter Open Space land use zone would encompass the remaining areas of the Lab's hill site and indicate areas of the Lab where future development would be primarily reserved for minor maintenance or support structures or paths and where the open, wooded, or grassland character of the hillside site would be retained to the extent feasible. Much of the Perimeter Open Space zone would comprise parts of the site where development potential is restricted due to constraints such as habitat quality and vegetation, seismic risk, utility easements, adjacent uses, and similar limitations. Throughout these areas various maintenance activities would continue to preserve and enhance appropriate vegetation characteristics.

The LRDP calls for developing clusters of research and academic uses close to one another and creating usable, attractive plazas and other open spaces that would function as “commons” for nearby buildings. This clustering of development would allow the Lab to evolve into a more campus-like setting, fostering interaction and informal encounters among Lab staff and supporting the “team science” heritage of the Lab.

2.1.4.2 Transportation, Circulation, and Parking

Several circulation improvements are planned to improve vehicular access while minimizing potential pedestrian-vehicular conflicts. Improvements are planned for the major Lab circulation routes to allow two-way traffic on Chamberlain Road and other routes, including widening and the removal of some roadside parking. A new north-south roadway is proposed east of the Advanced Light Source (Building 6) to more efficiently connect the Lab’s two primary east-west roadways. Improvements to the intersection of Glaser and Lawrence Roads are proposed to similarly enhance north-south circulation and improve safety. Improvements to the existing Blackberry Canyon Gate and Strawberry Canyon Gate would provide for longer queuing lanes, new guard houses, and improved signage and landscaping. Additional improvements would include development of a new service access road, a new service access gate planned off Centennial Drive, and improved emergency access and egress.

Bicycle access would continue to be provided on the major and minor roads. Where feasible, bicycle lanes would be provided; in most cases bicycles would share the roadway with cars and trucks, as the moderate speeds dictated by the hill site are suitable to bicycle and vehicle use of the roads. Bicycle parking would be located at building entries and/or at the edges of outdoor open spaces centered in building clusters.

The 2006 LRDP includes a Pedestrian Circulation Plan that illustrates planned improvements to the pedestrian network and identifies the relationship of this network to the shuttle system and the commons areas. Pedestrian paths would be improved or added, in particular where they would reinforce important connections between and within the research clusters.

Under the 2006 LRDP, parking on the hill site would increase by approximately 500 net new spaces for a total of 2,800 parking spaces. However, the ratio of adjusted daily population to parking spaces would not increase over the life of the Plan. Two new parking structures are proposed to be located near the Lab gates and several mid-sized parking lots would be created, primarily on sites of buildings to be demolished. These lots and structures would consolidate parking spaces removed from roadsides, service areas, the interiors of research clusters, and building sites. Consolidating the parking closer to the gates would be expected to reduce auto circulation within the Lab, creating a more pedestrian-friendly environment, and would also reduce the parking-related impervious surface area at the Lab by concentrating parking in multi-story structures that occupy less ground area per parking space than do surface lots.

2.1.4.3 Open Space Plan

Under the 2006 LRDP, a substantial portion of the Lab main hill site would be designated as Perimeter Open Space. This land use zone would encompass areas set aside due to constraints that require that minimal intrusion or activity occur, and other areas that are intended to remain primarily as open space because they enhance the visual image of the Lab from within and outside the site. Perimeter Open Space would consist of 56 acres, or 28 percent of the 202 acres on the main hill site. These areas around the periphery of the Lab are proposed to be maintained primarily as they currently exist, due to their important biological, aesthetic, or other characteristics.

Within the zones where research facilities are currently located, and where future research facilities would be focused, there is a wide variety of open space conditions. Due to the hilly nature of the Lab site, spaces between development clusters, and even between buildings, may function as open space. These spaces are usually rustic in character with trees and a variety of grasses or shrubs. These areas would be maintained in their natural states. In a limited number of cases it may be necessary to re-grade or reshape these areas to facilitate the siting of a future research facility. In such cases, efforts would be made to retain and/or replace trees and other elements that contribute to the open space character of the Lab site.

As part of the LRDP's aim of strengthening the Lab's campus-like form, most new buildings would be located on infill sites and/or adjacent to existing facilities, resulting in a higher density of development within each cluster and retention of more undeveloped space between clusters. Outdoor spaces for pedestrian uses would be located toward the center of the clusters, in spaces formally defined by the edges of new and existing buildings. The specific configuration and design of new development within the clusters would be guided by illustrative plans and by the LBNL Design Guidelines that, while separate from the LRDP, would support the Lab's objectives and address specific design of outdoor spaces and buildings.

At present, the areas most central to the research clusters are typically parking lots, are occupied by temporary facilities (many of which have been in place for many years), or consist of roads or service areas. As proposed under the 2006 LRDP, a large percentage of existing parking and service areas would be relocated, allowing for reconfiguration of the research clusters to function more efficiently and to be connected to one another by pedestrian paths. In addition, improvements to roads would be made to accommodate transit stops, bicycle parking, pedestrian sidewalks, and other amenities to support the Lab's transportation demand management efforts. The intent of the LRDP is to create a usable outdoor space, such as a plaza, within each cluster. These outdoor spaces would be scaled to be appropriate for the cluster of facilities, with amenities to encourage informal use.

2.1.4.4 Landscape and Vegetation Management

While additional research facilities would be added to the Lab in coming years, the hill site is anticipated to retain a strong sense of open space and landscape. The 2006 LRDP includes plans to reinforce this natural appearance, both from outside views as well as from views within the site. The Land Use Plan identifies areas of the campus that would remain undeveloped, and the proposed Landscape Framework further defines the ways in which these various open spaces would be planted and otherwise improved. The 2006 LRDP Landscape Framework identifies five key categories of landscape: (1) Rustic, (2) Rustic Riparian, (3) Screening, (4) Ornamental, and (5) Significant Ornamental. Each area would be landscaped or maintained differently.

The vast majority of the Lab site is characterized by the rustic, diverse landscape mosaic of oak and mixed hardwood forests, native and non-native grasslands, chaparral, coastal scrub, marsh and wetland communities, and riparian scrubs and forests that would be retained in their naturalistic state. Maintenance activities in the rustic zones would be undertaken to maintain the health of these areas. Pedestrian paths would be carefully aligned through these areas, but in general most Lab activities would not occur in these zones.

Several riparian environments that occur on the hill site have significant habitat value. These rustic riparian environments would be protected from development, with only maintenance activities permitted.

Existing or proposed stands of screening trees would obscure views of Lab buildings. Important stands of trees that currently screen Lab buildings from view from the surrounding community would be maintained, and additional screening would be added where it can help maintain the distinctive character of the site. Screening trees would also be added within the main site along Centennial Drive, which passes alongside the Lab.

As the common areas within the clusters of research uses are reconfigured to provide more usable outdoor areas, ornamental landscaping would be used to reinforce their attractiveness through the use of color, texture, and visual interest. In particular the Central Commons, the primary gathering space of the Lab, would be landscaped and furnished to provide a diversity of usable outdoor environments for special events. At the highest activity pedestrian areas – the Central Commons and secondary commons spaces – special plantings can be used to heighten visual interest.

The developed areas of the Lab correspond to the research clusters, support areas and parking lots and are currently landscaped with a variety of plant materials. Within the developed portions of the site, where high levels of pedestrian activity occur, ornamental landscapes would be used to add color, visual interest, and other amenities. This strategy would be continued as aging or outdated facilities are removed and new ones are added.

As described in the 2006 LRDP, the Laboratory is a campus-like setting maintained in a manner similar to a research park. Continuous improvements in landscaping for both developed and undeveloped areas of the Lab are anticipated under the 2006 LRDP. This landscape management approach is consistent with the Laboratory's fire-safe vegetation management measures that annually remove tree limbs a minimum of six to eight feet from the ground, mow or allow grazing of grasses, remove brush from most vegetated areas of the site, and plant ornamental species near buildings for fire safety. Berkeley Lab's existing vegetation management would continue under the 2006 LRDP.[5] The Lab's vegetation management program would continue to encourage native plants and removal of invasive exotic plants, including French broom, artichoke thistle, Cape ivy, and pampas grass. Eucalyptus and other non-native tree stands across the site would continue to be removed or thinned.

2.1.4.5 Infrastructure and Utilities

The 2006 LRDP foresees improvements to Berkeley Lab's infrastructure to increase reliability, flexibility, and efficiency, and to increase redundancy in the provision of critical services and utilities. Included among the LRDP's Development Principles is an intention to locate upgraded and new service lines in corridors.

Utility upgrades would include projects to improve water, natural gas, electrical, sanitary sewer, storm sewer, and compressed air utility infrastructure. During the past approximately 20 years, LBNL has replaced, re-lined, or re-routed approximately half of its sanitary sewer pipes. Under the 2006 LRDP, the Lab would also continue replacing aging sanitary sewer infrastructure to reduce stormwater infiltration during wet weather conditions. The Strawberry Monitoring Station would be upgraded and the Centennial Drive sewer main from the Life Sciences area would be replaced. Additionally, LBNL would continue working with UC Berkeley and the City of Berkeley to identify a feasible solution to accommodate increased effluent on the Strawberry Outfall due to project-related growth. LBNL has completed a study reviewing four options to divert LBNL-related sanitary sewer flows around problematic sewer lines in Berkeley.

The LRDP is consistent with the University's Presidential Policy for Green Building Design and Clean Energy Standards, adopted in July 2003 (amended October 24, 2003), which seeks to minimize the University's impact on the environment and to reduce the University's dependence on non-renewable energy. The policy is based on the Leadership in Energy and Environmental Design (LEED) rating system promulgated by the U.S. Green Building Council. Berkeley Lab will design and build all new buildings to meet the LEED "certified" rating, at a minimum, and will strive to meet the higher "silver" rating with additional sustainability features proven to be lifecycle cost-effective. The LRDP states that Berkeley Lab will develop a sustainability strategy integrating the Lab's site, climate, and infrastructure-intensive facilities to achieve the most sustainable facility practicable.

2.1.5 Project Variant

The project variant is analyzed in the event that Berkeley Lab management decides during the course of the planning period to consolidate most of its personnel on the main hill site. Under this scenario, up to approximately 350 employees currently working off-site would be transferred to the main hill site and approximately 25 LBNL staff would continue to work off of the Lab's main hill site or the UC Berkeley campus.

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5 Three biologically sensitive areas of the Laboratory have been identified as low fire risk, and are not managed on an annual basis. However, to preserve trees, brush and grasses on the perimeter of these areas are managed annually.

2.1.6 Conceptual Portrayal of Potential Development: Illustrative Development Scenario

For purposes of describing specific physical impacts that could reasonably be expected to occur as a result of development anticipated pursuant to the LRDP, this EIR evaluates an Illustrative Development Scenario, which represents a reasonable outcome of LRDP implementation. The Illustrative Development Scenario (see Figure III-9 in Chapter III) is a conceptual portrayal of potential development under the LRDP that would be consistent with the 2006 LRDP goals and objectives, the LBNL Design Guidelines, and the LRDP's proposed development uses and square footages. The Illustrative Development Scenario is intended to provide a conservative basis for the analysis of environmental impacts. Actual overall development that is approved and constructed pursuant to the LRDP would be less intense than portrayed in the scenario. The scenario was developed before the proposed 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. At any particular site, however, the level of development may approach the intensity that is portrayed in the scenario, so the scenario remains an appropriate and conservative basis for evaluating the potential environmental impacts of the proposed 2006 LRDP.

The EIR uses the Illustrative Development Scenario in the following ways:

1) To illustrate potential development pursuant to the 2006 LRDP based upon a conceptual portrayal of such potential development, and therefore give the reviewer an illustrative sense of the scope and scale of potential development at any particular site pursuant to the LRDP.

2) To provide a basis for the EIR's analysis of project impacts consistent with the CEQA Guidelines provisions for program EIRs and consideration and evaluation of future actions after the program EIR has been certified; and

3) To provide a basis for such quantified or modeled studies as the Human Health Risk Assessment and visual simulations.

The Illustrative Development Scenario shows approximate siting and dimensions of new buildings, parking garages, and roadway changes, and demolition of existing buildings. Consistent with the LRDP Land Use Plan, the Illustrative Development Scenario indicates that development of major new buildings would take place within the Research and Academic, Central Commons, and Support Services zones of the Lab. Parking structures and a number of parking lots would be spread relatively evenly throughout the Lab. Two redevelopment areas are identified, in the Old Town and Bevatron areas. The Illustrative Development Scenario also includes the already constructed Molecular Foundry building.

While actual development at LBNL under the term of the 2006 LRDP would likely not be precisely what is presented in this Illustrative Development Scenario, LBNL would consider how each individual project conforms to the assumptions and impact analyses presented in the 2006 LRDP EIR to determine what, if any, further CEQA documentation is necessary at that time. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Sections 15168(d)(1-3). This use of the Illustrative Development Scenario in connection with further approvals is subject to the overall limitations on subsequent review that have been stated elsewhere in this EIR. In particular, this EIR (including the Illustrative Development Scenario) will not be used as a first-tier EIR for, or to reduce or streamline the subsequent CEQA processing of, any project that, when added to other construction pursuant to this LRDP, exceeds a net total of 980,000 gross square feet of new construction or 320,000 gross square feet of demolition.

It is important to understand the difference between the provisions of the proposed LRDP and the descriptions contained in the Illustrative Development Scenario. If adopted, the provisions of the LRDP will become binding planning guidelines and policies for the Laboratory, and later projects carried out by the Laboratory must be consistent with the LRDP (unless the LRDP is amended). In contrast, the descriptions contained in the Illustrative Development Scenario are not binding or governing policies, but the Illustrative Development Scenario will be part of the information that is considered in determining the appropriate form of CEQA review for later approvals of specific projects pursuant to the LRDP. Thus the scenario is illustrative, and is provided in this EIR for the purpose of evaluating the impacts of development that may occur pursuant to the proposed LRDP. Under the CEQA Guidelines, for later approvals based on a program EIR, the Illustrative Development Scenario may be considered (along with other information, and along with the overall limitations on subsequent review that have been stated elsewhere in this EIR) in determining whether the proposed later approval is within the scope of this EIR's analysis, or whether some level of further analysis is required under CEQA.

2.1.7 Required Project Approvals and Intended Uses of This EIR

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land owned or controlled by the University. The Board of Regents is the University's decision-making body and is responsible for approving the LRDP and the physical facilities to be constructed on University-owned land. The Regents will review and consider this EIR in conjunction with review and consideration of the LRDP. It is anticipated that these documents would be presented for The Regents' consideration and approval at one of the 2007 Regents meetings after the Lab has prepared a Final EIR including responses to all of the comments that have been submitted. In addition, the Berkeley Lab Design Guidelines, which are referenced in this EIR and included in Appendix B, are proposed to be adopted by the Lab as a companion document to the 2006 LRDP.

This EIR is intended to be used for the following actions, and will serve the following purposes:

1) The EIR provides The Regents with information upon which to evaluate the environmental implications of the LBNL 2006 LRDP, including environmental impacts and mitigation measures that could avoid some of those impacts, and the EIR will be used as the CEQA document for The Regents' consideration of the 2006 LRDP, and the adoption of required findings and other actions by The Regents in connection with their consideration and possible adoption of the LRDP.

2) The EIR will also serve as the CEQA document for the adoption by the Lab of the Berkeley Lab Design Guidelines.

3) The EIR will also be utilized in connection with the consideration by the Lab and/or by The Regents of specific projects pursuant to the LRDP, and possibly for the later modification of such projects. Pursuant to CEQA Guidelines Section 15168 and as described in Chapter I (Introduction), some projects may be approved as within the scope of this EIR and other projects will be approved after a second-tier CEQA document is prepared. Any use of this EIR in connection with subsequent approval is subject to two additional restrictions, also described in Chapter I, that resulted from consultations with the City of Berkeley. This EIR will not be used as the first-tier EIR for (or otherwise to streamline review of) any project exceeding a net total of 980,000 gross square feet of new construction or 320,000 gross square feet of demolition, and a new traffic study will be prepared on the earliest to occur of ten years after this EIR is certified or the date on which development at the Lab pursuant to the 2006 LRDP reaches 375 net new parking spaces.

4) Consistent with the use of this EIR for specific projects pursuant to CEQA Guidelines Section 15168, this EIR will also provide information to responsible agencies with permitting or approval authority over projects that may be implemented under the 2006 LRDP, including the potential approvals listed under “permitting and approvals” below; and

5) This EIR is also intended to be used by the Lab and by The Regents, consistent with the provisions of CEQA, in connection with other specific actions that may be necessary or desirable to approve and implement the 2006 LRDP.

2.2 Environmental Impacts

Impacts and mitigation measures of implementation of the proposed 2006 LRDP are summarized in Table II-1, at the conclusion of this chapter.

This EIR identifies significant unavoidable impacts in the following topic areas: aesthetics (changes in views and in visual character), air quality (cumulative exposure to toxic air contaminants), cultural resources (demolition or alteration of historical resources), noise (temporary construction-related noise impacts, and contribution to cumulative construction noise impacts), and traffic (unacceptable levels of service at local intersections and contribution to cumulative intersection impacts).

2.3 Alternatives

This Draft EIR analyzes four alternatives to the proposed 2006 LRDP: a no project alternative (as required by CEQA), two reduced project alternatives, a Preservation alternative, and an off-site alternative. These alternatives are summarized below. Additionally, a reservation alternative and a no growth alternative were considered and rejected; the explanation is given in Chapter V.

2.3.1 No Project Alternative

2.3.1.1 Description

The No Project Alternative would result in development at the main LBNL site pursuant to the existing 1987 LRDP, and the proposed 2006 LRDP would not be implemented. Under the No Project Alternative, the amount of occupiable building space would increase up to approximately 2 million gsf, or roughly 13 percent above existing conditions, and the ADP would increase by about nine percent, to 4,750. No increases in the parking supply would occur. With the exception of a few projects that have been approved but are not yet constructed, future development at the hill site would require demolition of existing space. Such redevelopment on the hill site would be subject to project-specific environmental review, most likely tiered from the 1987 LRDP EIR, as amended. Additionally, any future development would be subject to the goals, objectives and mitigation measures identified within the 1987 LRDP and 1987 LRDP EIR, as amended.

Projects that have been approved pursuant to the 1987 LRDP, but not yet constructed, that would likely be developed and constructed under the No Project Alternative with continued implementation of the 1987 LRDP include the 25,000-square-foot Guest House, the approximately 30,000-square-foot User Support Building, and the 7,100-square-foot Animal Care Facility, identified within the Illustrative Development Scenario as Buildings S-5, S-6, and S-15, respectively. The Computational Research & Theory (CRT) Building (Building S-1 under the Illustrative Development Scenario), could also be constructed under the No Project Alternative, at a later date, following removal of Building 51 and the Bevatron. Under the No Project Alternative, roadway and parking improvements (but not an increase in parking spaces) and utility upgrades that are part of the project would be constructed. To accommodate future growth under the No Project Alternative, an increase in off-site leased space could occur.

The No Project Alternative would advance few, if any, of the objectives of the proposed project related to the continuing advancement of science and improvement of facilities at LBNL.

2.3.1.2 Impacts

As compared with the proposed project, the No Project Alternative would result in fewer impacts, and the intensity of the impacts described in Chapter IV of this EIR would be substantially less than with the proposed project. The No Project Alternative would not avoid the project's significant and unavoidable cultural resources impact of demolition of the Building 51 complex and the Bevatron, although this alternative could reduce the significant and unavoidable impact associated with the potential for implementation of the 2006 LRDP to cause a substantial adverse change in the significance of historical resources that have not yet been identified. Like the project, this alternative would contribute to a significant, unavoidable cumulative air quality impact related to emissions of toxic air contaminants. The No Project Alternative would avoid the project's significant and unavoidable aesthetic, noise and traffic impacts. Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.3.2 Reduced Growth 1 Alternative

2.3.2.1 Description

The Reduced Growth 1 Alternative would consist of development at the main hill site at a lower intensity than what is proposed under the 2006 LRDP. This alternative would provide for an ADP of up to about 5,135, up to 2,176,200 square feet of occupiable building space at the main hill site and approximately 2,675 parking spaces at the hill site. Because this alternative would reduce the significant and unavoidable impacts associated with the project more than would any other alternative other than the No Project Alternative, this alternative would be considered the environmentally superior alternative.

Compared to the proposed 2006 LRDP (including the reduction and the scope of the proposed LRDP in response to comments from the City of Berkeley), this alternative would represent about 63 percent of the net new occupiable building space, about 76 percent of the new ADP, and 75 percent of the net new parking spaces proposed under the 2006 LRDP. Under this alternative, future demand for any additional building space would be accommodated in leased space at off-site locations.

While this alternative would be more likely to meet key project objectives than would the No Project Alternative, it would not fully meet the Lab's objectives. Specifically, by allowing for less growth in space and population on the hill site, this alternative would be less conducive to the advancement of LBNL's scientific mission, and it could limit the Lab's ability to develop research facilities and infrastructure to meet anticipated future growth in research. Additionally, this alternative would not foster collaborative work environments among researchers, since it could result in a split of resources between locations as greater use of some off-site locations could be necessary to accommodate the Lab's future growth.

2.3.2.2 Impacts

The Reduced Growth 1 Alternative would generally result in lesser impacts than would the proposed 2006 LRDP, due to the lesser intensity of development, although this alternative would, like the project, result in a significant and unavoidable impact on cultural resources due to demolition of the Building 51 complex and the Bevatron, as well as on other potential resources. Also like the project, this alternative would result in significant, unavoidable impacts—albeit at a lesser intensity—on visual quality, would result in significant, unavoidable project-specific and cumulative impacts related to construction noise, and would contribute to a significant unavoidable cumulative air quality impact related to emissions of toxic air contaminants. The Reduced Growth 1 Alternative would avoid the project's significant traffic impact at the Hearst-Gayley/La Loma intersection, but would have project-specific and cumulative significant and unavoidable impacts at other local intersections, in a manner similar to the project. Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.3.3 Reduced Growth 2 Alternative

2.3.3.1 Description

The Reduced Growth 2 Alternative proposes a development intensity at the main hill site that is lower (both in terms of ADP and occupiable building space) than the intensity of development that was initially proposed in the 2006 LRDP when the Notice of Preparation was issued. However, this alternative would have a development intensity at the main hill site than is greater than the ADP and occupiable building space proposed under Reduced Growth 1 Alternative, and would provide somewhat less net new occupiable building space than that currently proposed pursuant to the 2006 LRDP, but incrementally more ADP. The Reduced Growth 2 Alternative could result in an ADP up to about 5,400, up to 2,350,000 square feet of occupiable building space at the main hill site, and approximately 2,675 parking spaces at the hill site. Compared to the 2006 LRDP as currently proposed, including the reduction in scope pursuant to the comments from the City of Berkeley, this alternative represents 102.5 percent of the new ADP, about 89 percent of the net new occupiable building space, and 75 percent of the net new parking spaces. When compared to the LRDP as initially proposed when the Notice of Preparation was issued, this alternative represents roughly 90 percent of the new ADP, about three-quarters of the net new occupiable building space, and 62.5 percent of the net new parking spaces.

2.3.3.2 Impacts

The Reduced Growth 2 Alternative would have impacts that would be very similar to those of the currently proposed 2006 LRDP, although it would have somewhat lesser impacts than the LRDP as originally proposed and described in the Notice of Preparation. This alternative would have the same significant, unavoidable impacts as the proposed project on cultural resources (demolition of the Building 51 complex and the Bevatron and other potential resources), visual quality (changes in views and visual character), and noise (project-specific and cumulative construction noise impacts). Like the project, this alternative would result in a significant, unavoidable cumulative impact related to emissions of toxic air contaminants. The Reduced Growth 2 Alternative would avoid the project’s significant traffic impact at the Hearst-Gayley/La Loma intersection, but would have project-specific and cumulative significant and unavoidable impacts at other local intersections, in a manner similar to the project. Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.3.4 Preservation Alternative with Non-LBNL Use of Historical Resources

2.3.4.1 Description

Under the Non-LBNL Use Preservation Alternative, a limited number of key historical resources, when determined to be no longer of feasible use to Berkeley Lab, would be dedicated to non-LBNL uses and could be managed by another public agency, such as the National Park Service. This alternative was originally drafted for the EIR on the proposed demolition of Building 51 and the Bevatron, with the intention of actively preserving Building 51 and the Bevatron equipment within it. It is assumed that this alternative could possibly be extended to a limited number of other key historical resources, should such resources be identified and be proposed for demolition by the Lab. (To date, no other such resources have been proposed for demolition.) Under this alternative, another agency would maintain and preserve the historical resource(s) in accordance with the *Secretary of the Interior's Standards for Preservation*, and would allow limited public access for interpretive/educational purposes.

While this alternative could reduce or eliminate significant impacts to historical resources, it could substantially complicate implementation of the proposed LRDP, particularly if multiple historical resources were to be involved over time. Moreover, the Lab's existence as a secure facility would largely limit public access to such resources.

2.3.4.2 Impacts

The Non-LBNL Use Preservation Alternative would avoid the proposed 2006 LRDP's significant, unavoidable effects on cultural resources but would result in the same impacts as the proposed project in other respects, as the development program would otherwise be the same. Therefore, this alternative would have the same significant, unavoidable impacts as the proposed project on visual quality (changes in views and visual character), noise (project-specific and cumulative construction noise impacts), air quality (significant unavoidable cumulative impact related to emissions of toxic air contaminants), and transportation (project-specific and cumulative significant and unavoidable impacts at local intersections).

Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.3.5 Off-Site Alternative

2.3.5.1 Description

The Off-Site Alternative proposes that all development under the 2006 LRDP, including increases in ADP, occupiable building space and parking spaces, would be accommodated at the hill site and at an off-site location in the Bay Area, specifically the Richmond Field Station (RFS). The RFS, owned by The UC Regents, occupies approximately 162 acres on the shore of San Francisco Bay, about six miles to the northwest of the LBNL main site. The RFS site consists of approximately 90 acres of upland, industrially zoned land that is used primarily for research and development, and 72 acres of marsh and tidal mudflat. The site is in a historically industrialized zone. At the RFS, an ADP of 390 would be accommodated, and 383,800 square feet of new occupiable building space and 225 new parking spaces would be constructed.

The development program at the hill site would accommodate the remaining projected growth under the 2006 LRDP, and would be the same as the Reduced Growth 1 Alternative. Under the Off-Site Alternative, development at the hill site, compared to the 2006 LRDP, would represent 63 percent of the occupiable building space, about three-quarters of the ADP, and 75 percent of the parking spaces proposed under the 2006 LRDP.

Taking into account LBNL growth at the hill site and the RFS under this alternative, the overall development potential at the 2025 planning horizon for the Lab would be the same as initially proposed in the 2006 LRDP when the Notice of Preparation was issued. While this alternative would meet key project objectives regarding levels of ADP, occupiable building space, and parking, this alternative would not meet the project objectives to expand functionality of Lab facilities, provide for cross-disciplinary research, or foster collaborative work environments among researchers, since it would result in a division of resources between locations.

2.3.5.2 Impacts

The Off-Site Alternative would generally result in lesser impacts on the LBNL main hill site than would the proposed 2006 LRDP, although it would not avoid the project's significant and unavoidable impacts on cultural resources (demolition of the Building 51 complex and the Bevatron and other potential resources), visual quality (changes in views and visual character), noise (project-specific and cumulative construction noise impacts), and air quality (significant unavoidable cumulative impact related to emissions of toxic air contaminants). This alternative would avoid the project's significant traffic impact at the Hearst-Gayley/La Loma intersection, but would have project-specific and cumulative significant and unavoidable impacts at other local intersections, in a manner similar to the project. Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.4 Impact Summary Table

Table II-1 presents a summary of impacts and mitigation measures identified in this report. It is organized to correspond with environmental issues discussed in Chapter IV. The table is arranged in three columns: 1) environmental impacts (with level of significance prior to mitigation, if applicable, noted in parentheses); 2) mitigation measures; and 3) level significance after mitigation. For a complete description of potential impacts and mitigation measures, please refer to the technical section within Chapter IV.

TABLE II-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Aesthetics and Visual Quality		
VIS-1: Construction of the proposed LRDP buildings would create temporary aesthetic nuisances for adjacent land uses. (Less than Significant)	None required.	Less than Significant
VIS-2: The proposed project could alter views of the LBNL site, and could result in a substantial adverse effect to a scenic vista or substantially damage scenic resources. (Significant and Unavoidable)	No mitigation is identified beyond the implementation of the LBNL Design Guidelines and the accompanying policy direction in the draft LRDP, and this impact is considered significant and unavoidable. However, Chapter V of this EIR includes the Reduced Growth 1 Alternative, which would result in lesser changes in the visual environment by constructing less overall building square footage and buildings of reduced height and mass. This alternative would result in lesser aesthetic impacts than would the proposed project.	Significant and Unavoidable
VIS-3: The proposed project would alter the existing visual character of the Lab site and could substantially degrade the existing visual character and quality of the site and its surroundings. (Significant and Unavoidable)	No mitigation is identified beyond the implementation of the LBNL Design Guidelines and the accompanying policy direction in the draft LRDP, and this impact is considered significant and unavoidable. However, Chapter V of this EIR includes the Reduced Growth 1 Alternative, which would result in lesser changes in the visual environment by constructing less overall building square footage and buildings of reduced height and mass. This alternative would result in lesser aesthetic impacts than would the proposed project.	Significant and Unavoidable
VIS-4: Implementation of the LRDP would introduce new sources of light and glare into the LBNL site and increase the overall level of ambient light in the site vicinity. (Significant; Less than Significant with Mitigation)	**VIS-4a:** All new buildings on the LBNL hill site constructed pursuant to the 2006 LRDP shall incorporate design standards that ensure lighting would be designed to confine illumination to its specific site, in order to minimize light spillage to adjacent LBNL buildings and open space areas. Consistent with safety considerations, LBNL project buildings shall shield and orient light sources so that they are not directly visible from outside their immediate surroundings. **VIS-4b:** New exterior lighting fixtures shall be compatible with existing lighting fixtures and installations in the vicinity of the new building, and will have an individual photocell. In general, and consistent with safety considerations, exterior lighting at building entrances, along walkways and streets, and at parking lots shall maintain an illumination level of not more than 20 Lux (approximately 2 foot-candles). **VIS-4c:** All new buildings on the LBNL hill site constructed pursuant to the 2006 LRDP shall incorporate design standards that preclude or limit the use of reflective exterior wall materials or reflective glass, or the use of white surfaces for roofs, roads, and parking lots, except in specific instances when required for energy conservation.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Aesthetics and Visual Quality (cont.)		
VIS-5: Implementation of the LRDP, in conjunction with cumulative development, would alter the visual character of, and change views of, the Oakland-Berkeley hills in the vicinity of Berkeley Lab. (Less than Significant)	None required.	Less than Significant
Air Quality		
AQ-1: Construction of new facilities proposed under the LBNL 2006 LRDP would generate short-term emissions of fugitive dust and criteria air pollutants that would affect local air quality in the vicinity of construction sites. (Significant; Less than Significant with Mitigation)	**AQ-1a:** The BAAQMD's approach to dust abatement calls for "basic" control measures that should be implemented at all construction sites, "enhanced" control measures that should be implemented at construction sites greater than four acres in area, and "optional" control measures that should be implemented on a case-by-case basis at construction sites that are large in area or are located near sensitive receptors, or that, for any other reason, may warrant additional emissions reductions (BAAQMD, 1999). During construction of individual projects proposed under the LRDP, LBNL shall require construction contractors to implement the appropriate level of mitigation (as detailed below), based on the size of the construction area, to maintain project construction-related impacts at acceptable levels; this would reduce the potential impact to a less-than-significant level. Elements of the "basic" dust control program for project components that disturb less than one acre shall include the following at a minimum: • Water all active construction areas at least twice daily. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water should be used whenever possible. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer). • Pave, apply water three times daily (or as sufficient to prevent dust from leaving the site), or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Air Quality (cont.)		
AQ-1 (cont.)	• Sweep daily or as appropriate (with water sweepers using reclaimed water if possible) all paved access roads, parking areas and staging areas at construction sites. • Sweep streets daily or as appropriate (with water sweepers using reclaimed water if possible) if visible soil material is carried onto adjacent public streets. Elements of the "enhanced" dust abatement program for project components that disturb four or more acres shall include all of the "basic" measures in addition to the following measures: • Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more). • Enclose, cover, water twice daily (or as sufficient to prevent dust from leaving the site), or apply (non-toxic) soil stabilizers to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 miles per hour. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways. • Replant vegetation in disturbed areas as quickly as possible. Elements of the "optional" control measures are strongly encouraged at construction sites that are large in area or located near sensitive receptors, or that for any other reason may warrant additional emissions reductions: • Install wheel washers for all exiting trucks, or wash off tires or tracks of all trucks and equipment leaving the site. • Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas. • Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 miles per hour. • Limit the area subject to excavation, grading, and other construction activity at any one time.	

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Air Quality (cont.)		
AQ-1 (cont.)	• Pave all roadways, driveways, sidewalks, etc. as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used. • Designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust off-site. Their duties shall include holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons shall be provided to the BAAQMD prior to the start of construction. **AQ-1b:** To mitigate equipment exhaust emissions, LBNL shall require its construction contractors to comply with the following measures: • Construction equipment shall be properly tuned and maintained in accordance with manufacturers' specifications. • Best management construction practices shall be used to avoid unnecessary emissions (e.g., trucks and vehicles in loading and unloading queues would turn their engines off when not in use). • Any stationary motor sources such as generators and compressors located within 100 feet of a sensitive receptor shall be equipped with a supplementary exhaust pollution control system as required by the BAAQMD and the California Air Resources Board. • Incorporate use of low-NOx emitting, low-particulate emitting, or alternatively fueled construction equipment into the construction equipment fleet where feasible, especially when operating near sensitive receptors. • Reduce construction-worker trips with ride-sharing or alternative modes of transportation.	
AQ-2: Proposed development under the LBNL 2006 LRDP would generate long-term emissions of criteria air pollutants from increases in traffic and stationary sources. (Less than Significant)	None required.	Less than Significant
AQ-3: Proposed development under the LBNL 2006 LRDP would increase carbon monoxide concentrations at busy intersections and congested roadways in the project vicinity. (Less than Significant)	None required.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Air Quality (cont.)		
AQ-4: Implementation of the proposed 2006 LRDP would expose people to toxic air contaminants. (Significant; Less than Significant with Mitigation)	**AQ-4a:** To avoid the single location where implementation of the 2006 LRDP would result in an increase in health risk in excess of the 10-in-one-million threshold, LBNL shall adjust, prior to the construction of parking structure PS-1 (or similarly configured building), the exhaust system of the existing generator near Building 90 to reduce or eliminate the restriction on upward exhaust flow caused by the existing rain cap. For example, modeling indicates that removal of the rain cap would reduce the risk caused by construction of parking structure PS-1 in proximity to the existing generator to a level below 10 in one million. The Lab could install a hinged rain cap, which would prevent moisture infiltration into the generator but still allow unobstructed exhaust flow and would avoid the significant impact identified in the health risk assessment.	Less than Significant
AQ-5: The project, together with anticipated future cumulative development in Berkeley and the Bay Area in general, would contribute to regional increases in criteria air pollutants. (Less than Significant)	None required.	Less than Significant
AQ-6: Even though cumulative emissions of toxic air contaminants would decrease, implementation of the LBNL 2006 LRDP, in combination with other potential contributing projects, would contribute to cumulative emissions of toxic air contaminants that result in an excess cancer risk that exceeds, and would continue to exceed, 10 in one million. (Significant and Unavoidable)	Because most of the cancer risk from TACs is due to diesel particulate, measures to reduce the risk (beyond regulations already in place that will substantially reduce diesel particulate emissions in the next 20 years) would include those measures that could reduce vehicular travel to and from Berkeley Lab. Implementation of Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program (see Section IV.L, Transportation/Traffic), would result in a concomitant increase in vehicular emissions, including those of TACs. However, even with implementation of this measure, Berkeley Lab, as a major employer and thus a substantial source of vehicular traffic, would likely continue to contribute to Bay Area-wide emissions of TACs for the foreseeable future.	Significant and Unavoidable
Biological Resources		
BIO-1: Development proposed under the 2006 LRDP would result in the permanent and/or temporary removal of some existing native and non-native vegetation. (Less than Significant)	None required.	Less than Significant
BIO-2: Development under the 2006 LRDP could result in adverse impacts to drainages and/or wetlands subject to Corps and CDFG jurisdiction, including permanent or temporary fill, and accidental discharges of fill materials or other deleterious substances during construction. (Significant; Less than Significant with Mitigation)	**BIO-2a:** Future development under the 2006 LRDP shall avoid, to the extent feasible, the fill of potentially jurisdictional waters. Therefore, during the design phase of any future development project that may affect potentially jurisdictional waters, a preliminary evaluation of the project site shall be made by a qualified biologist to determine if the site	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-2 (cont.)	is proximate to potentially jurisdictional waters and, if deemed necessary by the biologist, a wetlands delineation shall be prepared and submitted to the Corps for verification. Most development projected under the 2006 LRDP would have no potential for impacts on jurisdictional waters. However, development in specific locations including Buildings S-2 and S-0, as well as Parking Structures and Lots PS-1 and PL-9 and Roads R-2 and R-5, could require fill of or create the potential for accidental discharges to jurisdictional waters. It should be noted that the preferable form of mitigation recommended by the Corps is avoidance of jurisdictional waters. To the extent practicable, new development under the 2006 LRDP shall be located so as to avoid the fill of jurisdictional waters. **BIO-2b:** Any unavoidable loss of jurisdictional waters shall be compensated for through the development and implementation of a project-specific Wetlands Mitigation Plan. In the event that potential impacts to streams resulting from a 2006 LRDP development project are identified, compensation for loss of jurisdictional waters would be based on the Corps-verified wetlands delineation identified in Mitigation Measure BIO-2.a. During the permit application process for specific development project(s) with identified impacts on jurisdictional drainages or wetlands, LBNL would consult with the Corps, CDFG, and Regional Water Quality Control Board regarding the most appropriate assessment and mitigation methods to adequately address losses to wetland function that could occur as a result of the development project(s). A project-specific wetland mitigation plan would be developed prior to project implementation and submitted to permitting agencies for their approval. The plan may include one or more of the following mitigation options: restoration, rehabilitation, or enhancement of drainages and wetlands in on-site areas that remain unaffected by grading and project development or off-site at one or more suitable locations within the project region; creation of on-site or off-site drainages or wetlands at a minimum of a 1:1 functional equivalency or acreage ratio (as verified by the Corps); purchase of credits in an authorized mitigation bank acceptable to the Corps and CDFG; contributions in support of restoration and enhancement programs located within the project region (such as those operated by local non-profit organizations including the Friends of Strawberry Creek, the Urban Creeks Council, or the Waterways Restoration Institute); or other options approved by the appropriate regulatory agency at the time of the specific project approval.	

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
	All mitigation work proposed in existing wetlands or drainages on- or off-site shall be authorized by applicable permits. **BIO-2c:** To the extent feasible, construction projects that might affect jurisdictional drainages and/or wetlands could be scheduled for dry-weather months. Avoiding ground-disturbing activities during the rainy season would further decrease the potential risk of construction-related discharges to jurisdictional waters.	
BIO-3: Construction activities proposed under the 2006 LRDP could adversely affect special-status nesting birds (including raptors) such that they abandon their nests or such that their reproductive efforts fail. (Significant; Less than Significant with Mitigation)	**BIO-3:** Direct disturbance, including tree and shrub removal or nest destruction by any other means, or indirect disturbance (e.g., noise, increased human activity in area) of active nests of raptors and other special-status bird species (as listed in Table IV.C-1) within or in the vicinity of the proposed footprint of a future development project shall be avoided in accordance with the following procedures for Pre-Construction Special-Status Avian Surveys and Subsequent Actions. No more than two weeks in advance of any tree or shrub removal or demolition or construction activity involving particularly noisy or intrusive activities (such as concrete breaking) that will commence during the breeding season (February 1 through July 31), a qualified wildlife biologist shall conduct pre-construction surveys of all potential special-status bird nesting habitat in the vicinity of the planned activity and, depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on nesting special-status nesting birds: 1. Pre-construction surveys are not required for demolition or construction activities scheduled to occur during the non-breeding season (August 1 through January 31). 2. If pre-construction surveys indicate that no nests of special-status birds are present or that nests are inactive or potential habitat is unoccupied, no further mitigation is required. 3. If active nests of special-status birds are found during the surveys, a no-disturbance buffer zone will be created around active nests during the breeding season or until a qualified biologist determines that all young have fledged. The size of the buffer zones and types of construction activities restricted within them will be determined through consultation with the CDFG, taking into account factors such as the following:	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-3 (cont.)	a. Noise and human disturbance levels at the project site and the nesting site at the time of the survey and the noise and disturbance expected during the construction activity; b. Distance and amount of vegetation or other screening between the project site and the nest; and c. Sensitivity of individual nesting species and behaviors of the nesting birds. 4. Noisy demolition or construction activities as described above (or activities producing similar substantial increases in noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any breeding birds taking up nests would be acclimated to project-related activities already under way). However, if trees and shrubs are to be removed during the breeding season, the trees and shrubs will be surveyed for nests prior to their removal, according to the survey and protective action guidelines 3a through 3c, above. 5. Nests initiated during demolition or construction activities would be presumed to be unaffected by the activity, and a buffer zone around such nests would not be necessary. 6. Destruction of active nests of special-status birds and overt interference with nesting activities of special-status birds shall be prohibited. 7. The noise control procedures for maximum noise, equipment, and operations identified in Section IV.I, Noise, of this EIR shall be implemented.	
BIO-4: Removal of trees and other proposed construction activities during the breeding season could result in direct mortality of special-status bats. In addition, construction noise and human disturbance could cause maternity roost abandonment and subsequent death of young. (Significant; Less than Significant with Mitigation)	**BIO-4:** Project implementation under the 2006 LRDP shall avoid disturbance to the maternity roosts of special-status bats during the breeding season in accordance with the following procedures for Pre-Construction Special-Status Bat Surveys and Subsequent Actions. No more than two weeks in advance of any demolition or construction activity involving concrete breaking or similarly noisy or intrusive activities, that would commence during the breeding season (March 1 through August 31), a qualified bat biologist, acceptable to the CDFG, shall conduct pre-demolition surveys of all potential special-status bat	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-4: (cont.)	breeding habitat in the vicinity of the planned activity. Depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on breeding special-status bats: 1. If active roosts are identified during pre-construction surveys, a no-disturbance buffer will be created by the qualified bat biologist, in consultation with the CDFG, around active roosts during the breeding season. The size of the buffer will take into account factors such as the following: a. Noise and human disturbance levels at the project site and the roost site at the time of the survey and the noise and disturbance expected during the construction activity; b. Distance and amount of vegetation or other screening between the project site and the roost; and c. Sensitivity of individual nesting species and the behaviors of the bats. 2. If pre-construction surveys indicate that no roosts of special-status bats are present, or that roosts are inactive or potential habitat is unoccupied, no further mitigation is required. 3. Pre-construction surveys are not required for demolition or construction activities scheduled to occur during the non-breeding season (September 1 through February 28). 4. Noisy demolition or construction activities as described above (or activities producing similar substantial increases in noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any bats taking up roosts would be acclimated to project-related activities already under way). However, if trees are to be removed during the breeding season, the trees would be surveyed for roosts prior to their removal, according to the survey and protective action guidelines 1a through 1c, above. 5. Bat roosts initiated during demolition or construction activities are presumed to be unaffected by the activity, and a buffer is not necessary.	

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-4: (cont.)	6. Destruction of roosts of special-status bats and overt interference with roosting activities of special-status bats shall be prohibited. 7. The noise control procedures for maximum noise, equipment, and operations identified in Section IV.I, Noise, of this EIR shall be implemented.	
BIO-5: Implementation of the 2006 LRDP could result in take or harassment of Alameda whipsnakes. (Significant; Less than Significant with Mitigation)	**BIO-5a:** With the approval of the USFWS on a case-by-case basis, relocate any snake encountered during construction that is at risk of harassment; cease construction activity until the snake is moved to suitable refugium. Alternatively, submit a general protocol for relocation to the USFWS for approval prior to project implementation. **BIO-5b:** Conduct focused pre-construction surveys for the Alameda whipsnake at all project sites within or directly adjacent to areas mapped as having high potential for whipsnake occurrence. Project sites within high potential areas shall be fenced to exclude snakes prior to project implementation. This would not include ongoing and non-site specific activities such as fuel management. Methods for pre-construction surveys, burrow excavation, and site fencing shall be developed prior to implementation of any project located within or adjacent to areas mapped as having high potential for whipsnake occurrence. Such methods would be developed in consultation or with approval of USFWS for any development taking place in USFWS officially designated Alameda whipsnake critical habitat. Pre-construction surveys of such project sites shall be carried out by a permitted biologist familiar with whipsnake identification and ecology (Swaim, 2002). These are not intended to be protocol-level surveys but designed to clear an area so that individual whipsnakes are not present within a given area prior to initiation of construction. At sites where the project footprint would not be contained entirely within an existing developed area footprint and natural vegetated areas would be disturbed any existing animal burrows shall be carefully hand-excavated to ensure that there are no whipsnakes within the project footprint. Any whipsnakes found during these surveys shall be relocated according to the Alameda Whipsnake Relocation Plan. Snakes of any other species found during these surveys shall also be relocated out of the project area. Once the site is cleared it shall then be fenced in such a way as to exclude snakes for the duration of the project. Fencing shall be maintained intact throughout the duration of the project.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-5 (cont.)	**BIO-5c:** (1) A full-time designated monitor shall be employed at project sites that are within or directly adjacent to areas designated as having high potential for whipsnake occurrence, or (2) Daily site surveys for Alameda whipsnake shall be carried out by a designated monitor at construction sites within or adjacent to areas designated as having moderate potential for whipsnake occurrence. Each morning, prior to initiating excavation, construction, or vehicle operation at sites identified as having moderate potential for whipsnake occurrence, the project area of applicable construction sites shall be surveyed by a designated monitor trained in Alameda whipsnake identification to ensure that no Alameda whipsnakes are present. This survey is not intended to be a protocol-level survey. All laydown and deposition areas, as well as other areas that might conceal or shelter snakes or other animals, shall be inspected each morning by the designated monitor to ensure that Alameda whipsnakes are not present. At sites in high potential areas the monitor shall remain on-site during construction hours. At sites in moderate potential areas the monitor shall remain on-call during construction hours in the event that a snake is found on-site. The designated monitor shall have the authority to halt construction activities in the event that a whipsnake is found within the construction footprint until such time as threatening activities can be eliminated in the vicinity of the snake and it can be removed from the site by a biologist permitted to handle Alameda whipsnakes. The USFWS shall be notified within 24 hours of any such event. **BIO-5d:** Alameda whipsnake awareness and relevant environmental sensitivity training for each worker shall be conducted by the designated monitor prior to commencement of on-site activities. All on-site workers at applicable construction sites shall attend an Alameda whipsnake information session conducted by the designated monitor prior to beginning work. This session shall cover identification of the species and procedures to be followed if an individual is found on-site, as well as basic site rules meant to protect biological resources, such as speed limits and daily trash pickup. **BIO-5e:** Hours of operation and speed limits shall be instituted and posted.	

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-5 (cont.)	All construction activities that take place on the ground (as opposed to within buildings) at applicable construction sites shall be performed during daylight hours, or with suitable lighting so that snakes can be seen. Vehicle speed on the construction site shall not exceed 5 miles per hour. **BIO-5f:** Site vegetation management shall take place prior to tree removal, grading, excavation, or other construction activities. Construction materials, soil, construction debris, or other material shall be deposited only on areas where vegetation has been mowed. Areas where development is proposed under the 2006 LRDP are subject to annual vegetation management involving the close-cropping of all grasses and ground covers; this management activity would be performed prior to initiating project-specific construction. Areas would be re-mowed if grass or other vegetation on the project site becomes high enough to conceal whipsnakes during the construction period. In areas not subject to annual vegetation management, dense vegetation would be removed prior to the onset of grading or the use of any heavy machinery, using goats, manual brush cutters, or a combination thereof.	
BIO-6: Project activities allowed under the LRDP, including facilities and road construction in areas designated for use as Research and Academic, Central Commons, and Support Services zones, as well as vegetation management activities in designated Perimeter Open Space, could result in the take of special-status plant species. Construction activities, as well as vegetation management activities, have the potential to disturb or result in mortality of these species or eliminate their habitat. (Significant; Less than Significant with Mitigation)	**BIO-6a:** Floristic surveys for special-status plants shall be conducted at specific project sites where suitable habitat is present. Floristic surveys shall also be conducted in designated Perimeter Open Space. All occurrences of special-status plant populations, if any, shall be mapped. Although no special-status plants have been observed at LBNL during past biological resource surveys, the distribution and size of plant populations often vary from year to year, depending on climatic conditions. Therefore, a baseline survey of all non-developed areas, including the designated Perimeter Open Space areas, where there is potential for future development or vegetation management activities, should be conducted in accordance with USFWS and CDFG guidelines by a qualified botanist during the period of identification for all special-status plants. During this initial survey, any special-status plant populations found, as well as areas with high potential for supporting special-status plants (i.e., less disturbed areas, rock outcrops and other areas of thin soils, areas supporting a relatively high proportion of native plant species) would be identified and mapped. Thereafter, surveys of Perimeter Open Space areas where ongoing vegetation management (i.e., active vegetation removal to minimize potential wildland fire	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-6 (cont.)	damage to facilities and personnel) activities would be undertaken, and that are mapped as supporting or having potential to support special-status plant species, would be conducted in April and June every five years. In those proposed LRDP development sites where suitable habitat is present for special-status species identified as having a moderate to high potential for occurrence (see Table IV.C-1, p. IV.C-10), protocol-level rare plant surveys would be conducted prior to construction. Surveys should be conducted during the periods of identification for all species under consideration at each applicable development site, the timing and scope to be directed by a qualified botanist. During the initial survey, any special-status plant populations found, as well as all areas with high potential for supporting special-status plants (i.e. less disturbed areas, rock outcrops and other areas of thin soils, areas supporting a relatively high proportion of native plant species), would be identified and mapped. **BIO-6b:** Seeds or cuttings shall be collected from sensitive plant species found within developable areas and open space and at risk of being any adversely affected, or sensitive plants found in these areas shall be transplanted. If special-status plants are found during floristic surveys and are at risk of being adversely affected, a qualified botanist working in conjunction with an expert in native plant horticulture, CNPS, and CDFG, would collect seeds, bulbs, and cuttings for propagation and planting in specific project revegetation efforts as well as restoration of native habitat within designated Open Space. Perennial species could be transplanted, if found in undeveloped locations that have a high likelihood for future development. Due to its unreliability, translocation alone should not be relied upon as a sole means of mitigation; however, healthy individuals of any special-status plant species should be transplanted to areas of suitable habitat that are protected in perpetuity. The relocation sites may be located either on or off the LBNL hill site. If the areas for transplanting are located off-site, they should be within a 20-mile radius of the project site. Plants should be relocated to areas with ecological conditions (slope, aspect, microclimate, soil moisture, etc.) as similar to those in which they were found as possible. Existing plants could also be held in containers for specific post-project revegetation efforts on-site.	

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-7: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding (primarily residential) development in the Oakland-Berkeley hills, would contribute to a reduction of open space and, consequently, habitat for native plants and wildlife, including special-status species. (Less than Significant)	None required.	Less than Significant
Cultural Resources		
CUL-1: Implementation of the 2006 LRDP could cause a substantial adverse change in the significance of historical resources, as defined in CEQA Guidelines Section 15064.5, including historical resources that have not yet been identified. (Significant and Unavoidable)	**CUL-1:** Mitigation for the demolition or substantial physical alteration of Buildings 71 and 88, and other historical buildings and structures at LBNL found to be significant historical resources at the completion of the ongoing surveys and research, shall include the development of a Memorandum of Agreement (MOA) among the Department of Energy, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation. Full implementation of the MOA's stipulations shall also be required as part of this mitigation measure.	Significant and Unavoidable
CUL-2: The proposed 2006 LRDP would allow demolition of buildings and structures at LBNL that have been found to be ineligible for listing in the National Register individually or as a district. (Less than Significant)	None required.	Less than Significant
CUL-3: Implementation of the proposed 2006 LRDP could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. (Significant; Less than Significant with Mitigation)	**CUL-3:** If an archaeological artifact is discovered on-site during construction under the proposed LRDP, all activities within a 50-foot radius shall be halted and a qualified archaeologist shall be summoned within 24 hours to inspect the site. If the find is determined to be significant and to merit formal recording or data collection, adequate time and funding shall be devoted to salvage the material. Any archaeologically important data recovered during monitoring shall be cleaned, catalogued, and analyzed, with the results presented in a report of finding that meets professional standards.	Less than Significant
CUL-4: Implementation of the proposed 2006 LRDP could disturb human remains, including those interred outside of formal cemeteries. (Significant; Less than Significant with Mitigation)	**CUL-4:** In the event that human skeletal remains are uncovered during construction or ground-breaking activities resulting from implementation of the 2006 LRDP at the LBNL site, CEQA Guidelines Section 15064.5(e)(1) shall be followed: • In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Cultural Resources		
CUL-4 (cont.)	(1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: (A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and (B) If the coroner determines the remains to be Native American: (1) The coroner shall contact the Native American Heritage Commission within 24 hours. (2) The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. (3) The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or (2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. (A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission; (B) The descendant identified fails to make a recommendation; or (C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.	
CUL-5: Implementation of the proposed 2006 LRDP would not combine with other cumulative projects to result in an adverse change to the significance of historical resources that share historic significance with resources that could be lost at Berkeley Lab. (Less than Significant)	None required.s	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Geology and Soils		
GEO-1: Future construction projects within the Alquist-Priolo Zone could expose people or structures to surface fault rupture. (Significant; Less than Significant with Mitigation)	**GEO-1:** Seismic emergency response and evacuation plans for LBNL shall incorporate potential inaccessibility of the Blackberry Canyon entrance and identify alternative ingress and egress routes for emergency vehicles and facility employees in the event of roadway failure from surface fault rupture.	Less than Significant
GEO-2: Implementation of the LRDP would expose people and structures to seismic hazards such as groundshaking and earthquake-induced landsliding. (Significant; Less than Significant with Mitigation)	**GEO-2:** A site-specific, design-level geotechnical investigation shall occur during the design phase of each LBNL building project, and prior to approval of new building construction within the LBNL hill site. This investigation shall be conducted by a licensed geotechnical engineer and include a seismic evaluation of potential maximum ground motion at the site. Geotechnical investigations for sites within either a Seismic Hazard Zone for landslides or an area of historic landslide activity at LBNL, as depicted on Figures IV.E-2 and IV.E-3, or newly recognized areas of slope instability at the inception of project planning, shall incorporate a landslide analysis in accordance with CGS Publication 117. Geotechnical recommendations shall subsequently be incorporated into building design. Earthquakes and groundshaking in the Bay Area are unavoidable and may occur at some time during the period covered by the LRDP. Although some structural damage is typically not avoidable, building codes and local construction requirements have been established to protect against building collapse and to minimize injury during a seismic event. Considering that the future individual buildings would be constructed in conformance with the California Building Code, LBNL requirements, federal regulations and guidelines, and Mitigation Measure GEO-2, the risks of injury and structural damage from groundshaking and earthquake-induced landsliding would be reduced and the impacts, therefore, would be considered less than significant. Furthermore, as described in the Project Description, some of the buildings constructed pursuant to the LRDP would be occupied by staff relocated from other, older LBNL facilities, some of which were constructed in accordance with less stringent building code requirements than those that would apply to future construction. As of 2003, 14 percent of LBNL buildings were over 60 years old. Many of these buildings were constructed as temporary structures that were never replaced. The LRDP specifically proposes the demolition of some30 outdated buildings that together include approximately 250,000 square feet. In this regard, implementation of the LRDP would result in a beneficial seismic safety impact.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Geology and Soils		
GEO-3: Implementation of the LRDP would result in construction on soils that could be subject to erosion and instability. (Significant; Less than Significant with Mitigation)	**GEO-3a:** Construction under the LRDP shall be required to use construction best management practices and standards to control and reduce erosion. These measures could include, but are not limited to, restricting grading to the dry season, protecting all finished graded slopes from erosion using such techniques as erosion control matting and hydroseeding or other suitable measures. **GEO-3b:** Revegetation of areas disturbed by construction activities, including slope stabilization sites, using native shrubs, trees, and grasses, shall be included as part of all new projects. Compliance with California Building Code standards and compliance with Mitigation Measures GEO-2, GEO-3a, and GEO-3b would reduce potential impacts associated with expansive soils and soil erosion to a less-than-significant level.	Less than Significant
GEO-4: The proposed 2006 LRDP, when combined with cumulative growth, would increase the population exposed to geologic and seismic hazards. (Less than Significant)	None required for cumulative impacts, although Mitigation Measures GEO-1, GEO-2, GEO-3a, and GEO-3b would be implemented, as identified above.	Less than Significant
Hazards and Hazardous Materials		
HAZ-1: Demolition or renovation of existing structures could expose construction workers, the public, or the environment to hazardous materials in building materials. (Less than Significant)	None required.	Less than Significant
HAZ-2: Future construction activities, including earth-moving activities such as excavation and grading, could expose construction workers or the environment to hazardous materials. (Less than Significant)	None required.	Less than Significant
HAZ-3: Operation of LBNL pursuant to the 2006 LRDP, including proposed increases in laboratory and facility space, would increase the use of hazardous materials in research, facility construction, and facility maintenance activities, consequently resulting in increased generation, storage, transportation, and disposal of hazardous wastes, including transport associated with off-site disposal of hazardous and radioactive wastes, from research and facility maintenance activities. (Significant; Less than Significant with Mitigation)	**HAZ-3a:** LBNL shall continue to prepare an annual self-assessment summary report and a Site Environmental Report that summarize environment, health, and safety program performance and identify any areas where LBNL is not in compliance with environmental laws and regulations governing hazardous materials, and worker safety, emergency response, and environmental protection. An EH&S assessment of LBNL activities is performed annually, and these results are reported annually in the LBNL Self-Assessment Report.	Less than Significant
Hazards and Hazardous Materials		
HAZ-3 (cont.)	In addition, LBNL prepares an annual Site Environmental Report that	

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
	describes the environmental activities noted above. Implementation of this measure would ensure that the information in the LBNL Self-Assessment and Site Environmental Reports continues to be collected, reviewed, and provided. **HAZ-3b:** Prior to shipping hazardous materials to a hazardous waste treatment, storage, or disposal facility, LBNL shall confirm that the facility is licensed to receive the type of waste LBNL is proposing to ship. LBNL is required by DOE Order 435.1 to verify that the receiving facility has all appropriate licenses and that the waste meets all waste acceptance criteria of the receiving facility. **HAZ-3c:** LBNL shall require hazardous waste haulers to provide evidence that they are appropriately licensed to transport the type of wastes being shipped from LBNL. Shipping procedures at LBNL require all transporters of hazardous, radioactive, and mixed waste to provide evidence that they are appropriately licensed. **HAZ-3d:** LBNL shall continue its waste minimization programs and strive to identify new and innovative methods to minimize hazardous waste generated by LBNL activities. Each LBNL Division is required to identify and implement new waste minimization activities each year. The waste minimization program at LBNL reduced hazardous waste by 72% during the period 1993-2004 **HAZ-3e:** In addition to implementing the numerous employee communication and training requirements included in regulatory programs, LBNL shall undertake the following additional measures as ongoing reminders to workers of health and safety requirements: • Continue to post phone numbers of LBNL EH&S subject matter experts on the EH&S website. • Continue to post Emergency Response and Evacuation Plans in all LBNL buildings. • Continue to post sinks, in areas where hazardous materials are handled, with signs reminding users that hazardous materials and wastes cannot be poured down the drain.	

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Hazards and Hazardous Materials		
HAZ-3 (cont.)	• Continue to post dumpsters and central trash collection areas where hazardous materials are handled with signs reminding users that hazardous wastes cannot be disposed of as trash. **HAZ-3f:** LBNL shall update its emergency preparedness and response program on an annual basis and shall provide copies of this program to local emergency response agencies and to members of the public upon request.	
HAZ-4: Implementation of the LRDP would involve the handling of hazardous materials and wastes within one-quarter mile of an existing school. (Significant; Less than Significant with Mitigation)	See Mitigation Measures HAZ-3a through HAZ-3f, above.	Less than Significant
HAZ-5: Implementation of the LRDP could increase exposure of people or structures to hazards that could result from regional, compounded, or terrorist-related catastrophic events. (Less than Significant)	None required.	Less than Significant
HAZ-6: Implementation of the LRDP would expose people or structures to wildland fire hazards. (Less than Significant)	None required.	Less than Significant
HAZ-7: Implementation of the LRDP would contribute to cumulative increases in exposure to hazards and hazardous materials. (Less than Significant)	None required.	Less than Significant
Hydrology and Water Quality		
HYDRO-1: Construction pursuant to the LRDP, including earthmoving activities such as excavation and grading, could result in soil erosion and subsequent sedimentation of stormwater runoff or an increase in stormwater pollutants associated with construction-related hazardous materials. (Less than Significant)	None required.	Less than Significant
HYDRO-2: Implementation of the 2006 LRDP would adversely affect stormwater quality. (Less than Significant)	None required.	Less than Significant
HYDRO-3: Implementation of the LRDP would increase stormwater runoff rates and volumes, potentially resulting in erosion of creek channels or downstream flooding. (Less than Significant)	None required.	Less than Significant
HYDRO-4: Implementation of the LRDP, when combined with implementation of the UC Berkeley 2020 LRDP and other cumulative development, would not result in significantly adverse hydrologic or water quality impacts. (Less than Significant)	None required.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Land Use and Planning		
LU-1: Implementation of the proposed 2006 LRDP would increase building square footage and adjusted daily population (ADP) at LBNL. Because new construction would be within developed areas and would not introduce substantially new land uses, the 2006 LRDP would not physically divide an established community. (Less than Significant)	None required.	Less than Significant
LU-2: Implementation of the proposed 2006 LRDP would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect, nor would the project conflict with local land use regulations such that a significant incompatibility is created with adjacent land uses. (Less than Significant)	None required.	Less than Significant
LU-3: The proposed 2006 LRDP, when combined with cumulative growth in the project vicinity, would increase the intensity of existing land uses in the area but would not physically divide an established community, conflict with applicable land use regulations, or cause conflicts with existing uses. (Less than Significant)	None required.	Less than Significant
Noise		
NOISE-1: Development under the proposed LRDP would result in temporary noise impacts related to construction and demolition activities. (Significant and Unavoidable)	**NOISE-1a:** To reduce daytime noise impacts due to construction/demolition, LBNL shall require construction/demolition contractors to implement noise reduction measures appropriate for the project being undertaken. Measures that might be implemented could include, but not be limited to, the following: • Construction/demolition activities would be limited to a schedule that minimizes disruption to uses surrounding the project site as much as possible. Such activities would be limited to the hours designated in the Berkeley and/or Oakland noise ordinance(s), as applicable to the location of the project. This would eliminate or substantially reduce noise impacts during the more noise-sensitive nighttime hours and on days when construction noise might be more disturbing. • To the maximum extent feasible, equipment and trucks used for project construction shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).	Significant and Unavoidable

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Noise		
NOISE-1 (cont.)	• Stationary noise sources shall be located as far from adjacent receptors as possible. • At locations where noise may affect neighboring residential uses, LBNL will develop a comprehensive construction noise control specification to implement construction/demolition noise controls, such as noise attenuation barriers, siting of construction laydown and vehicle staging areas, and community outreach, as appropriate to specific projects. The specification will include such information as general provisions, definitions, submittal requirements, construction limitations, requirements for noise and vibration monitoring and control plans, noise control materials and methods. This document will be modified as appropriate for a particular construction project and included within the construction specification. **NOISE-1b:** For each subsequent project pursuant to the LRDP that would involve construction and/or demolition activities, LBNL shall engage a qualified noise consultant to determine whether, based on the location of the site and the activities proposed, construction/demolition noise levels could approach the property-line receiving noise standards of the cities of Berkeley or Oakland (as applicable). If the consultant determines that the standards would not be exceeded, no further mitigation is required. If the standards would be reached or exceeded absent further mitigation, one or more of the following additional measures would be required, as determined necessary by the noise consultant: • Stationary noise sources shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or other measures to the extent feasible. • Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever feasible.	

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Noise		
NOISE-1 (cont.)	• Noise from idling trucks shall be kept to a minimum. No trucks shall be permitted to idle for more than 10 minutes if waiting within 100 feet of a residential area. • If determined necessary by the noise consultant, a set of site-specific noise attenuation measures shall be developed before construction begins; possible measures might include erection of temporary noise barriers around the construction site, use of noise control blankets on structures being erected to reduce noise emission from the site, evaluation of the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings, and monitoring the effectiveness of noise attenuation measures by taking noise measurements. • If determined necessary by the noise consultant, at least two weeks prior to the start of excavation, LBNL or its contractor shall provide written notification to all neighbors within 500 feet of the construction site. The notification shall indicate the estimated duration and completion date of the construction, construction hours, and necessary contact information for potential complaints about construction noise (i.e., name, telephone number, and address of party responsible for construction). The notice shall indicate that noise complaints resulting from construction can be directed to the contact person identified in the notice. The name and phone number of the contact person also shall be posted outside the LBNL boundaries.	
NOISE-2: Development under the proposed LRDP would result in temporary vibration impacts related to construction activities. (Less than Significant)	None required.	
NOISE-3: Project-generated vehicle traffic associated with the proposed LRDP would result in an incremental, and likely imperceptible, long-term increase in ambient noise levels. (Less than Significant)	None required.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Noise		
NOISE-4: Continued operation of the LBNL hill site facility would result in a long-term increase in ambient noise levels. (Significant, Less than Significant with Mitigation)	**NOISE-4:** Mechanical equipment shall be selected and building designs prepared for all future development projects pursuant to the 2006 LRDP so that noise levels from future building and other facility operations would not exceed the Noise Ordinance limits of the cities of Berkeley or Oakland for commercial areas or residential zones as measured on any commercial or residential property in the area surrounding the future LRDP project. Controls that would typically be incorporated to attain adequate noise reduction would include selection of quiet equipment, sound attenuators on fans, sound attenuator packages for cooling towers and emergency generators, acoustical screen walls, and equipment enclosures.	Less than Significant
NOISE-5: Development under the proposed LRDP would result in temporary contributions to cumulative noise impacts related to construction and demolition activities. (Significant and Unavoidable)	Implementation of Mitigation Measures NOISE-1a and NOISE-1b would reduce the cumulative impact of construction noise to the maximum extent feasible. However, for purposes of a conservative analysis, the cumulative effect of construction noise is considered significant and unavoidable.	Significant and Unavoidable
NOISE-6: Development pursuant to the 2006 LRDP, together with anticipated future development at LBNL and in the surrounding area, including the UC Berkeley 2020 LRDP, would result in a cumulative increase in noise levels. (Less than Significant)	None required.	Less than Significant
Population and Housing		
POP-1: The proposed LRDP would produce an increase in the number of people working at LBNL but would not induce substantial population growth in the City of Berkeley or elsewhere in the region, either directly or indirectly. (Less than Significant)	None required.	Less than Significant
POP-2: The proposed LRDP, in conjunction with the proposed UC Berkeley 2020 LRDP and other projects that could be developed in Berkeley, would induce population growth in the City of Berkeley and the Bay Area, but the contribution of the 2006 LRDP to this impact would not be cumulatively considerable. (Less than Significant)	None required.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Public Services and Recreation		
PUB-1: The proposed project would result in an increase in demand for fire protection services. However, this increased demand would not result in the need for additional facilities for fire protection services. (Less than Significant)	None required.	Less than Significant
PUB-2: The proposed project would result in an increase in calls for police services. However, this increased demand would not result in the need for additional facilities for police protection services. (Less than Significant)	None required.	Less than Significant
PUB-3: Implementation of the 2006 LRDP would not result in the need for new or physically altered public school facilities. (Less than Significant)	None required.	Less than Significant
PUB-4: Implementation of the proposed 2006 LRDP would not significantly adversely affect the provision of parks and recreation. (Less than Significant)	None required.	Less than Significant
PUB-5: Under cumulative conditions, implementation of the 2006 LRDP would contribute to an increase in demand for fire protection services and police services. However, this increased demand would not result in the need for new or physically altered facilities, the construction of which could cause significant environmental impacts. (Less than Significant)	None required.	Less than Significant
PUB-6: Under cumulative conditions, implementation of the proposed 2006 LRDP would not result in the need for new or physically altered public school facilities. (Less than Significant)	None required.	Less than Significant
PUB-7: Under cumulative conditions, implementation of the proposed 2006 LRDP would not substantially affect the provision of parks and recreation facilities. (Less than Significant)	None required.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Transportation/Traffic		
TRANS-1: Implementation of the 2006 LRDP would degrade level of service at certain local intersections. (Significant and Unavoidable)	**TRANS-1a:** LBNL shall work with UC Berkeley and the City of Berkeley to design and install a signal at the Gayley Road/Stadium Rim Way intersection, when a signal warrant analysis shows that the signal is needed. The intersection would meet one-hour signal warrants for peak-hour volume and peak-hour delay under 2025 conditions with implementation of the LBNL 2006 LRDP. LBNL shall contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for a periodic (annual or biennial) signal warrant check to allow the City to determine when a signal is warranted, and for installation of the signal. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible measure(s). See also Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program. With the implementation of this mitigation measure, the intersection of Gayley Road/Stadium Rim Way would operate at an acceptable level of service (LOS B or better under traffic signal control) during both the a.m. and p.m. peak hours. Because LBNL could not implement this measure on its own, but would need the cooperation of UC Berkeley and/or the City of Berkeley, this impact would be considered significant and unavoidable. **TRANS-1b:** LBNL shall work with the City of Berkeley to design and install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows that the signal is needed. LBNL shall contribute funding, on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for a periodic (annual or biennial) signal warrant check to allow the City to determine when a signal is warranted, and for installation of the signal. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible measure(s). See also Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program.	Significant and unavoidable at (1) Hearst Avenue/Gayley Road/La Loma Avenue intersection; potentially mitigable to a less-than-significant level at (2) Gayley Road/Stadium Rim Way and (3) Durant Avenue/ Piedmont Avenue intersections, but considered significant and unavoidable because LBNL could not implement the mitigation measures (installation of traffic signals, with the Lab funding its fair share of the cost) on its own, as these improvements would be under the jurisdiction of the City of Berkeley.

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Transportation/Traffic		
TRANS-1 (cont.)	With the implementation of this mitigation measure, the Durant Avenue/Piedmont Avenue intersection would operate at an acceptable level of service (LOS B or better under traffic signal control) during both the a.m. and p.m. peak hours. Because LBNL could not implement this measure on its own, but would need the cooperation of the City of Berkeley, this impact would be considered significant and unavoidable. **TRANS-1c:** LBNL shall develop and implement a new Transportation Demand Management (TDM) Program to replace its existing TDM program. This enhanced TDM Program has been drafted in consultation with the City of Berkeley, and is proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The new draft proposed TDM Program is attached to this EIR as Appendix G. The proposed TDM Program includes several implementation phases tied to the addition of parking to LBNL. The final provisions of the TDM Program may be revised as it is finally adopted but will include a TDM coordinator and transportation committee, an annual inventory of parking spaces and a gate count, a study of more aggressive TDM measures, investigation of a possible parking fee, investigation of sharing services with UC Berkeley and an alternative fuels program. The new draft proposed TDM Program also includes a requirement that LBNL conduct an additional traffic study to reevaluate traffic impacts on the earliest to occur of 10 years following the certification of this EIR or the time at which the Lab formally proposes a project that will bring total development of parking spaces pursuant to the 2006 LRDP to or above 375 additional parking spaces.	
TRANS-2: Implementation of the 2006 LRDP would result in minor increases in transit ridership. (Less than Significant)	None required.	Less than Significant
TRANS-3: Implementation of the 2006 LRDP would result in an increase in ridership on LBNL shuttle buses, including additional demand for bicycle service on the inbound shuttles, potentially causing overcrowding on the shuttle buses or an inability by bicyclists to use the shuttle buses with their bicycles. (Significant; Less than Significant with Mitigation)	**TRANS-3:** LBNL shall develop and maintain a transportation plan designed to ensure that the current balance of transportation modes is maintained. This plan shall include 1) maintaining the same (or lesser) ratio of parking permits and parking spaces to average daily population (ADP), and 2) ensuring that levels of shuttle bus service and provision of bike racks on shuttle buses are sufficient to accommodate projected demand.	Less than Significant
TRANS-4: Implementation of the 2006 LRDP would increase parking demand but would provide additional parking that would be adequate to meet this demand. (Less than Significant)	None required.	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Transportation/Traffic		
TRANS-5: Implementation of the 2006 LRDP would marginally increase potential traffic conflicts with pedestrians or bicyclists. (Less than Significant)	None required.	Less than Significant
TRANS-6: Construction of new facilities proposed under the 2006 LBNL LRDP would temporarily and intermittently increase traffic volumes and parking demand above current conditions. (Less than Significant)	None required.	Less than Significant
TRANS-7: Traffic associated with construction of new facilities proposed under the 2006 LBNL LRDP could contribute to the degradation of pavement on Berkeley streets. (Less than Significant)	None required.	Less than Significant
TRANS-8: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding development in Berkeley and nearby communities that could affect the study intersections, would contribute to a degradation of level of service at local intersections. (Significant and Unavoidable)	**TRANS-8:** LBNL shall implement Mitigation Measure TRANS-1a (work with UC Berkeley and the City of Berkeley to design and install a signal at the Gayley Road/Stadium Rim Way intersection; LBNL would contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, to install the signal) and Mitigation Measure TRANS-1b (work with the City of Berkeley to design and install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows that the signal is needed; LBNL would contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, to install the signal and for monitoring to determine when a signal is warranted). With the implementation of these mitigation measure, the intersections of Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue would operate at LOS B or better during both the a.m. and p.m. peak hours. As explained earlier, the intersection of Hearst Avenue at Gayley Road/La Loma Avenue is currently signalized, and physical geometric limitations constrain improvements within its current right-of-way. Analyses indicate that little can be done to mitigate future LOS conditions without acquiring additional right-of-way or prohibiting certain turning movements, such as minor left-turn movements. Therefore, no mitigation is available for cumulative impacts on this intersection.	Traffic impacts were found to be significant and unavoidable at (1) Hearst Avenue/Gayley Road/La Loma Avenue intersection. Traffic impacts were found to be potentially mitigable to less-than-significant levels at (2) Gayley Road/Stadium Rim Way and (3) Durant Avenue/Piedmont Avenue intersections, but considered significant and unavoidable because LBNL could not implement mitigation measures on its own, as these improvements would be under the jurisdiction of the City of Berkeley.

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Utilities, Service Systems, and Energy		
UTILS-1: Implementation of the proposed 2006 LRDP would increase the demand for water. (Less than Significant)	None required.	Less than Significant
UTILS-2: Implementation of the proposed 2006 LRDP would generate additional wastewater, requiring system improvements to ensure that additional wastewater flows from the Lab are directed into unconstrained sub-basins. (Significant; Less than Significant with Mitigation)	**UTILS-2:** LBNL shall implement programs to ensure that additional wastewater flows from the Lab are directed into unconstrained sub-basins, as necessary and appropriate. LBNL shall continue to direct the Lab's existing western effluent flows into sub-basin 17-013. In addition, new flows at the Lab shall be directed into either sub-basin 17-013, sub-basin 17-304, unconstrained portions of sub-basin 17-503, or another sub-basin that has adequate capacity. Final design and implementation of these improvements shall be negotiated between the appropriate parties and shall undergo appropriate environmental review and approval. LBNL shall closely coordinate the planning, approval, and implementation of this mitigation with the City of Berkeley and the UC Berkeley, as appropriate.	Less than Significant
UTILS-3: Development proposed under the 2006 LRDP would generate solid waste, but would not require new facilities. (Less than Significant)	None required.	
UTILS-4: On-site construction due to development proposed under the 2006 LDRP would generate construction waste and debris. (Significant; Less than Significant with Mitigation)	**UTILS-4:** LBNL shall develop a plan for maximizing diversion of construction and demolition materials associated with the construction of the proposed project from landfill disposal.	Less than Significant
UTILS-5: Development proposed under the 2006 LDRP would create additional demand for electricity and natural gas, but would not result in the construction of new or expansion of existing energy production and/or transmission facilities. (Less than Significant)	None required.	Less than Significant
UTILS-6: The proposed 2006 LRDP, in combination with other reasonably foreseeable development in the surrounding area, would contribute to cumulative demand for utilities, service systems, and energy. (Less than Significant)	None required.	Less than Significant

CHAPTER III
Project Description

This EIR evaluates the adoption and implementation of the proposed Lawrence Berkeley National Laboratory 2006 Long Range Development Plan (2006 LRDP; also referred to herein as the CEQA "project") through a horizon year of 2025.

III.A. Overview

The proposed project consists of a Long Range Development Plan for Lawrence Berkeley National Laboratory (LBNL; also referred to herein as the "Lab," "Berkeley Lab," and "Laboratory"). Development and operational activities pursuant to the 2006 LRDP include construction, development, and demolition projects and Laboratory operational, research, and maintenance activities through the planning year 2025.[1]

The project site occupies 202 acres in the Oakland/Berkeley hills, on what is referred to in the EIR as the Lab's main "hill site." The 2006 LRDP addresses continuing and projected uses and activities on the hill site, as well as in building space occupied by the Lab in various buildings on the UC Berkeley campus and in various off-site locations, with a horizon year of 2025. The baseline assessment of building space used in this EIR was established in July 2003.

The proposed 2006 LRDP provides for construction of approximately 980,000 gross square feet (gsf) of additional research and support space, approximately 585,000 square feet of parking space (of which an estimated 372,000 square feet [64 percent] would be in parking structures for a net gain of 500 new parking spaces), and demolition of up to 320,000 gsf of building space that is or may become obsolete or that poses safety hazards. (Of the total of 320,000 gsf, approximately 50,000 gsf has already been demolished under the existing 1987 LRDP since the July 2003 baseline date for this document and approximately 270,000 gsf is projected to be demolished over the term of the approved LRDP.) Up to 600,000 gsf of renovation may take place to restore or rehabilitate existing buildings. The project would also include construction, expansion, or improvement of utility infrastructure and eight roadway improvements totaling approximately 5,800 linear feet.

1 While the planning horizon for the 2006 LRDPP is anticipated to be 2025, the LRDP could continue to be in effect beyond that year. If the LRDP continues in effect beyond 2025, any approved development pursuant to the LRDP would be required to be consistent with the LRDP, including provisions regarding development allocation, vehicle trips and parking limits.

The scope of the proposed 2006 LRDP and the amount of potential development under that LRDP have been reduced since the issuance of the Notice of Preparation for this EIR. The NOP anticipated a possible maximum of 1,240,000 gsf of new occupiable (research and support) space construction, and 440,000 gsf of demolition, leading to up to 800,000 net new gsf of occupiable space. Since the release of the NOP, however, it has become apparent to Lab staff that U.S. Department of Energy (DOE) funding priorities may limit the scope of development pursuant to the 2006 LRDP, and while it is possible that other funding sources may make up some of this difference, this reallocation of DOE priority is likely to decrease the amount of development on the main hill site. In addition, and more importantly, substantial concerns were raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed under the 2006 LRDP. For both of these reasons, the Lab determined that the 2006 LRDP and the proposed project presented in this EIR should be reduced in scope to 980,000 gsf of new occupiable building space construction, with 320,000 gsf of demolition, for a net total of 660,000 gsf of new occupiable space. This is a reduction of approximately 21 percent in the amount of possible new construction of occupiable space under the 2006 LRDP, and a reduction of 17.5 percent in the amount of possible net new occupiable space. LBNL may attempt to consolidate most of its staff and operations on its main hill site. A "project variant," in which most of LBNL's off-site staff would be moved onto the main hill site at some point during the planning period, is analyzed in this EIR concurrent with the analysis of the 2006 LRDP.[2]

The 2006 LRDP contains descriptions of Berkeley Lab science and technology goals and development principles for site and facilities development. In addition, a separate, companion document, the Berkeley Lab Design Guidelines, will provide direction for physical development under the 2006 LRDP. These proposed Design Guidelines are proposed to be adopted by the Lab following The Regents approval of the LRDP. These principles, strategies, and design guidelines are listed in Appendix B and are referred to in the Project Description and the various technical sections of this EIR, as appropriate.

The University of California is exempt under Article 9, Section 9 of the State Constitution from local planning, zoning, and redevelopment regulations whenever land under its control is used for purposes within its mission. As a federal facility—a U.S. Department of Energy National Laboratory—Lawrence Berkeley National Laboratory is also exempt from local planning, zoning, and redevelopment regulations.

This project description includes the following components:

Section III.B of this chapter sets forth the baseline site conditions and characteristics for the LBNL site. This includes a description and maps of the project site, and of existing facilities and programs. This also includes a discussion of the 1987 LRDP that is currently in effect. Since the baseline for analysis was set in 2003 when the Notice of Preparation was released, this section also includes a discussion of changes in the baseline since 2003. Section III.C of this chapter describes the institutional approach, principles and strategies that are included in the proposed 2006 LRDP.

2 The 2006 LRDP does not distinguish between the project and the project variant, per se, but is compatible with either scenario analyzed in this EIR.

Section III.D of this chapter describes the 2006 LRDP, including a description of potential development, the land use plan and land use zones, transportation circulation and parking improvements, open space planning, landscape and vegetation management provisions, and infrastructure and utilities requirements.

Section III.E of this chapter describes an Illustrative Development Scenario that was formulated so that this EIR could provide a greater level of disclosure of potential impacts than is normally provided in plan-level EIRs. This Scenario was used as the basis for some of the quantitative modeling that was performed to evaluate environmental impacts of potential development pursuant to the 2006 LRDP.

Section III.F of this chapter describes the required approvals for adoption and implementation of the 2006 LRDP, and the ways in which this EIR will be used in connection with those approvals.

III.B. Baseline Site Conditions and Characteristics

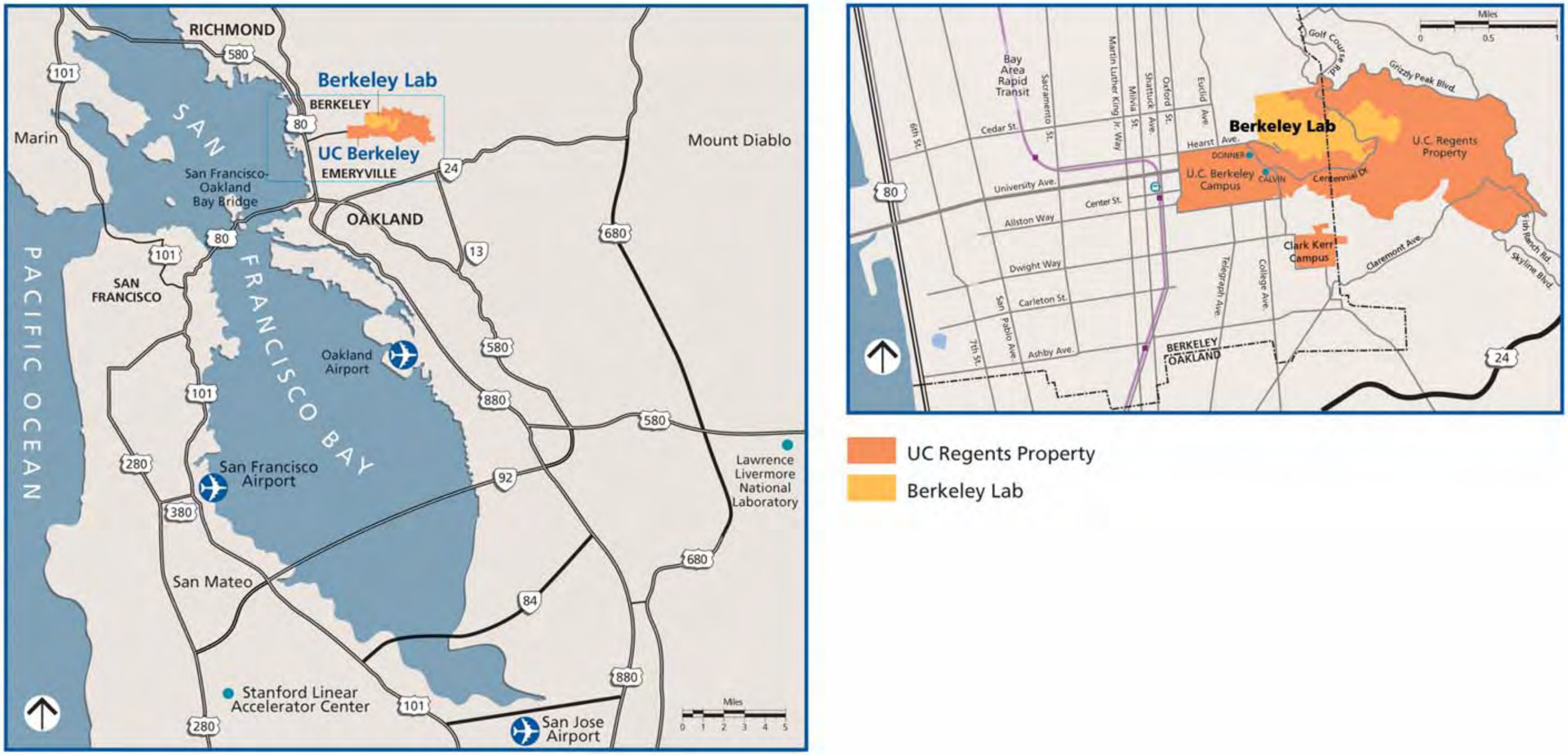
III.B.1 Project Site and Location

LBNL is located approximately three miles east of San Francisco Bay in the eastern hills of the cities of Berkeley and Oakland. The Lab occupies a 202-acre site (the main "hill site") within 1,183 acres of contiguous land owned by The Board of Regents of the University of California (The Regents or UC Regents) (see Figure III-1).[3] Building parcels on the Lab's hill site are leased by the University to the U.S. Department of Energy (DOE) for all major DOE constructed buildings. The DOE owns most of the facilities and structures within LBNL and contracts out the management and operation of the National Laboratory to the University.[4] The current contract between the DOE and UC extends through 2009, with renewal options through 2025.

The Lab also occupies approximately 100,000 square feet of off-site space at the UC Berkeley campus and approximately 338,000 gsf of other off-site leased spaces, mostly in Berkeley, Oakland, and Walnut Creek. (The UC Regents also own the Lab-occupied land at UC Berkeley; other off-site space is leased from private landowners.) Under the proposed 2006 LRDP, no substantial growth of lab-occupied space on the UC Berkeley campus is planned, although the buildings occupied may change over time. Existing LBNL research on the UC Berkeley campus in Donner and Calvin Laboratories operates under the memorandum of understanding between UC Berkeley and LBNL concerning Environmental, Health And Safety Policy and Procedures, as would any future space occupied in place of Donner and Calvin Labs at UC Berkeley.

3 Approximately 975 acres of adjacent UC Regents land is managed by the University of California, Berkeley.

4 Recently DOE has begun encouraging its contractors to assist in providing facilities for the National Laboratories through third-party financing. In this manner, DOE will lease buildings on a site that may have been be constructed by the University or other parties. DOE may issue a Statement of Mission need for the construction of the facilities, and it enters into lease agreements for the occupancy. The potential physical and environmental scope of any third-party financed facilities within the 202-acre LBNL main hill site is included in the proposed LRDP and this EIR.



SOURCE: Lawrence Berkeley National Laboratory (2006)

LBNL 2006 Long Range Development Plan . 201074

Figure III-1
Regional Location Map

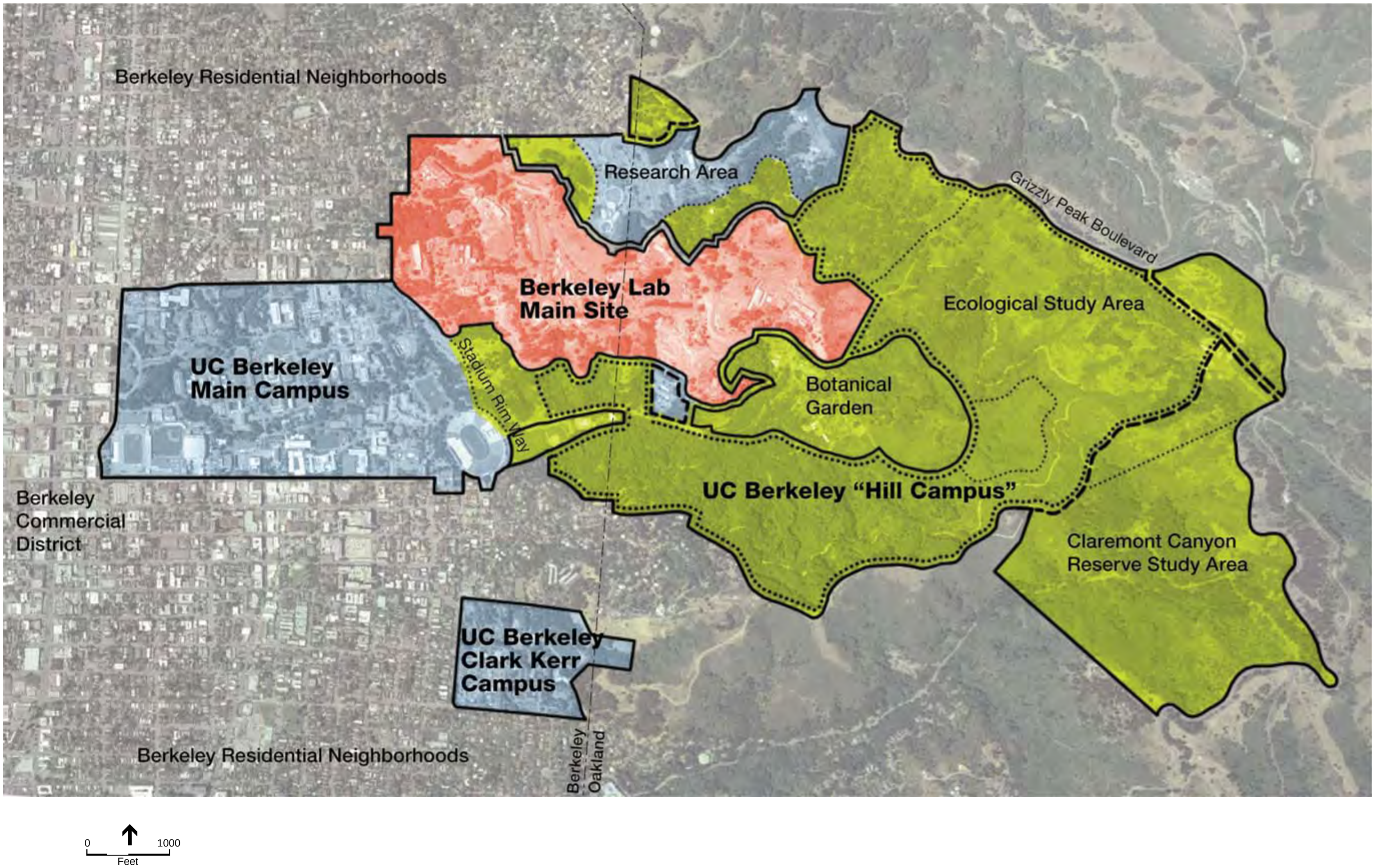
The Regents do not own, but lease and control, along with DOE, the approximately 338,000 square feet of LBNL space leased on the commercial market off of the main LBNL hill site. Under the 2006 LRDP, no substantial growth of commercial lease space is planned. However, as with space at UC Berkeley, the actual space used may change over time.

The LBNL site is a developed area that lies between UC Berkeley and residential neighborhoods of the City of Berkeley to the west and northwest. The UC Berkeley corporation yard, UC Berkeley recreation pools, sports fields, and walking trails, the UC Berkeley–managed Ecological Study Areas and the UC Berkeley Botanical Garden lie to the south, southeast, and east; and UC Berkeley–operated research and educational facilities lie to the northeast. Although developed, the LBNL site retains substantial vegetation and natural topographic features. Berkeley Lab is fenced for security and controlled access. As occurred under the 1987 LRDP, it is possible following adoption of the 2006 LRDP that there might be changes in operational and jurisdictional control over some parts of the Berkeley Lab site; for example, it is possible that a facility might be proposed to be jointly operated by UC Berkeley and the Lab. If such changes are proposed, the location of boundary and security fencing may change accordingly. No such joint operations or changes are currently proposed, although it is possible that joint operation will be proposed for the Helios Research Facility, which is currently anticipated to be proposed and review under CEQA in 2008.

Figure III-2 depicts the Lab in the context of surrounding land uses. As described above, the Lab also occupies space at the UC Berkeley campus, a public educational institution attended by approximately 32,000 graduate and undergraduate students.[5] In addition to the 180-acre UC Berkeley main campus, UC Berkeley also includes areas of Strawberry Canyon southeast of LBNL, as well as the University's "Hill Campus" to the east. The Lawrence Hall of Science is within this area, as are the Botanical Garden, the Silver Space Sciences Laboratory, and the Mathematical Sciences Research Institute, as well as large expanses of natural open space, including over 300 acres in the Ecological Study Area. The UC Berkeley Hill Campus also includes Strawberry Canyon Recreation Area and the adjacent Witter and Levine-Fricke sport fields. West and north of LBNL are residential neighborhoods within Berkeley; another residential neighborhood, Panoramic Hill, lies within both the cities of Berkeley and Oakland, across Strawberry Canyon to the south of the Lab. Regional open space lies beyond the UC Berkeley Hill Campus, including the 2,000-acre Tilden Regional Park to the northeast and east, and the 205-acre Claremont Canyon Regional Preserve to the south. Finally, the proposed project area includes off-site space leased by the University from private or public property owners.

The location and boundaries of LBNL are shown in Figure III-2 and Figure III-3, which portrays the proposed land use map for the 2006 LRDP evaluated in this EIR. The 2006 LRDP's proposed land uses are described later in this chapter.

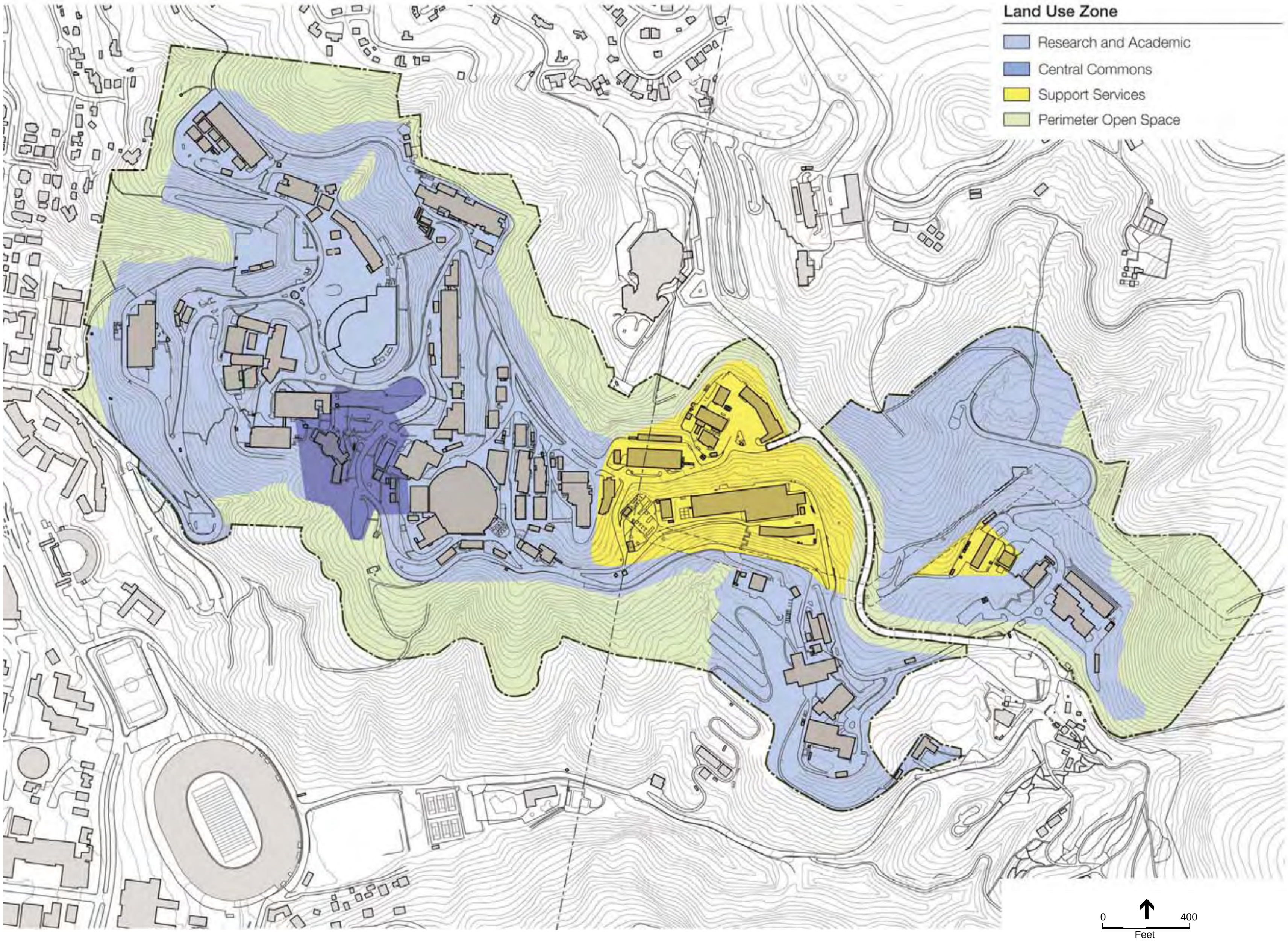
5 Land use at UC Berkeley, including facilities occupied by LBNL, is governed by UC Berkeley's 2020 LRDP.



SOURCE: LBNL, 2006

LBNL 2006 Long Range Development Plan . 201074

Figure III-2
Surrounding Land Uses



SOURCE: LBNL, 2006

LBNL 2006 Long Range Development Plan . 201074

Figure III-3
LRDP Land Use Map

III.B.2 Existing Facilities and On-Site Uses[6]

III.B.2.1 Historical Background

LBNL was established in 1931 when UC President Robert Gordon Sproul assigned a building for cyclotron research to Ernest O. Lawrence, a member of the UC Berkeley faculty. The Lab began on the UC Berkeley campus, but quickly expanded its facilities to other locations on the campus. In 1940, the first building was constructed in the Oakland-Berkeley hills—the prominent dome-covered 184-inch cyclotron, now the Advanced Light Source (Building 6), a familiar Berkeley Hills landmark. From this structure, LBNL has evolved to become a multi-program national laboratory with uses including laboratories, office space, research facilities, and support services. Under 14 scientific divisions,[7] Berkeley Lab staff perform research in the computing sciences, life and earth sciences, energy sciences, biosciences, and general sciences in a manner that ensures employee and public safety and environmental protection; develop and operate unique national experimental facilities for qualified investigators, including five “national user facilities”[8] that host visiting researchers; educate and train future generations of scientists and engineers to promote national science and education goals; and disseminate knowledge to users nationwide, fostering productive relationships between LBNL’s research programs and other research institutions and industry. (More discussion on historical background is available in “Berkeley Lab: Historical Perspective,” in the 2006 LRDP.)

III.B.2.2 Building Space

LBNL’s research and support activities are conducted in structures occupying a total of 2.2 million square feet, of which approximately 1.76 million square feet are located on the main hill site, 100,000 square feet on the UC Berkeley campus, and 340,000 square feet at other locations, including leased space in Berkeley, Oakland, Walnut Creek, and Washington D.C. (Although LBNL and UC Berkeley operate independently from one another, they do interact through cooperative research and joint appointments of some researchers.)

The main hill site has more than 150 buildings, many originally built as “temporary” single-purpose structures, more than 60 percent of which are more than 40 years old.[9] Across the Laboratory are terraces that serve as centers of development. Some areas of development, such as Building 90, the Building 71 complex, and the Building 66/62 complex, cluster activities on plateaus, while other areas, like the Building 84 complex and the Building 51 area, are located within relatively level hollows. In some areas, like the Building 77 complex and the Building 46 area, the terraces are linear, parallel with the natural hillside contours and the roadways along the contour lines.

6 Building space and population figures in this section refer to the 2003 baseline and are rounded.

7 Berkeley Lab’s research divisions include the Life and Environmental Sciences Divisions: Earth Sciences, Genomics, and Life Sciences; the Physical Sciences Divisions: Advanced Light Source, Chemical Sciences, Environmental Energy Technologies, Material Sciences, and Physical Biosciences; the Computing Sciences Divisions: Computational Research, and National Energy Research Scientific Computing Center; and General Sciences Divisions: Accelerator and Fusion Research, Engineering, Nuclear Science, and Physics.

8 LBNL National User Facilities are the Advanced Light Source, the National Center for Electron Microscopy, the National Energy Research Scientific Computing Center, the Energy Sciences Network, and the Molecular Foundry.

9 A figure depicting conditions of existing buildings on the Lab’s main hill site is provided in Appendix D.

Approximately one-third of the LBNL site is covered by impervious surfaces, including buildings, roads, and parking lots, while the remaining two-thirds of the site is pervious or otherwise not paved. The latter areas contain a variety of ornamental plants and native and non-native grasses, brush, and woodlands. Native trees, including oak and bay laurel, are present, along with non-native trees such as eucalyptus, pine, fir, and others. The impermeable areas also include utility corridors, some service roads, trails, chemical and radiation monitoring stations, sewers, hydraugers,[10] and drainage ditches.

Much of LBNL's research space on the UC Berkeley campus (approximately 40,000 square feet) is in the Donner and Calvin laboratory buildings. The amount of space used by LBNL on the UC Berkeley campus fluctuates from year to year, but does not exceed 100,000 square feet. A portion of LBNL's research and support staff is located in commercial leased space off-site, away from both the LBNL hill site and the UC Berkeley campus. The amount of leased space fluctuates from time to time based on the Lab's space needs and market conditions.

III.B.2.3 Population

Under baseline conditions, LBNL employed approximately 3,800 people, including about 1,400 scientists and engineers, 500 administrative staff, and 1,900 technical and support staff. An estimated 2,500 guest researchers visit LBNL each year. This translates into an adjusted daily population (ADP)[11] of approximately 4,375. Of this total, some 4,000 are on the main hill site and in laboratory space on the UC Berkeley campus.[12] Research staff in leased space in downtown Oakland and in Walnut Creek constitute an ADP of approximately 100 (about 50 at each location), and administrative staff in leased office space in downtown Berkeley constitute an ADP of about 225. About 50 ADP represent research staff who work in other remote locations.

III.B.2.4 Access, Circulation, and Parking

Lawrence Berkeley National Laboratory is approximately three miles east of Interstate 80, the nearest major freeway, and five miles northeast of the San Francisco-Oakland Bay Bridge. Vehicular access to the site occurs primarily along two routes: Hearst Avenue, which borders the north edge of the UC Berkeley campus and becomes Cyclotron Road at Gayley Avenue; and

[10] Hydraugers are in-hill drainage pipes installed at locations throughout the Lab to draw groundwater out of the hillside and prevent saturation of the soil that otherwise could lead to slumps and landslides.

[11] ADP represents the actual number of people at the Laboratory's main hill site, in Berkeley Lab space on the UC Berkeley campus, and in leased facilities on any given day. It is calculated by combining the Lab's full-time-equivalent employment, which totals approximately 3,400, with approximately 40 percent of the annual average number of registered guests (i.e., the guest researchers assumed present on any given day, along with vendors and construction contractors working on the site). The percentage of guests on-site will be periodically reviewed and this ADP factor periodically updated during the term of the LRDP. However, the total ADP of 5,525 allowed by the 2006 LRDP would not be modified without a formal amendment of the LRDP.

[12] Under baseline conditions, about 3,650 ADP are on the main hill site, while research staff on the UC Berkeley campus constitute an ADP of about 350. Many LBNL staff working at UC Berkeley hold "joint appointments" at both institutions; therefore, some travel to (and, if driving, park at) UC Berkeley, while others travel to (and, if driving, park at) LBNL and use the Lab shuttle to reach the UC Berkeley campus. These staff may also travel (generally by shuttle) between the two institutions.

Centennial Drive, which extends from Memorial Stadium through Strawberry Canyon to the Lawrence Hall of Science and Grizzly Peak Road. These roadways provide access to three controlled points of entry (Blackberry Canyon Gate on Cyclotron Road, Strawberry Canyon Gate on Centennial Drive, and Grizzly Peak Gate on Centennial Drive), all of which are staffed by security personnel. Grizzly Peak Gate is currently used as an entry gate during the morning commute hours, although it is available as an egress point at all times. One additional gate at "PG&E Point" provides ingress/egress to the Laboratory site for maintenance operations and emergency access. Additional pedestrian access is provided through additional pedestrian-only gates.

Circulation within the Lab site is primarily via two east-west roadways and connecting north-south roadways (Chamberlain Road and McMillan Road make up the primary "upper route" and Lawrence and Alvarez Roads form the "lower route"). Accompanying pathways and a series of connecting roadways, paths, stairways, and elevators allow staff and visitors to move among the Lab's buildings.

The main hill site provides approximately 2,300 permit parking spaces to qualifying Lab personnel and guests. These spaces are located primarily in lots distributed around the LBNL site where space was available and alongside Lab roadways, with the result that parking locations do not match the distribution of personnel. Additionally, as of 2003, LBNL leased approximately 135 parking spaces in downtown Berkeley that are assigned to designated employees working in leased office space, and the Lab maintains approximately 10 parking spaces at the Calvin and Donner laboratory buildings on the UC Berkeley campus. Parking spaces provided at buildings leased at other locations are not included in this analysis. LBNL operates a free intra-site shuttle service for employees and visitors on the hill site, and off-site between LBNL and the UC Berkeley campus, the downtown Berkeley and Rockridge BART stations, and AC Transit connections.

III.B.2.5 Utilities

The Lab maintains its own on-site utility distribution network for potable water (supplied from off-site by the East Bay Municipal Utility District [EBMUD]), including water for fire protection, sanitary sewer (connecting to City of Berkeley facilities and eventually to EBMUD mains and treatment plant), stormwater, electricity (supplied by the Western Area Power Administration over Pacific Gas & Electric lines), and natural gas (supplied by the Defense Fuel Supply Center via the Pacific Gas & Electric pipes). LBNL also employs several building specific or site-wide utilities, including a compressed air system, a low-conductivity water system, a closed-loop cooling water system, a purified water system, and a de-ionized water system, to accommodate research or specialized equipment.

III.B.2.6 Landscape and Vegetation Management

The Laboratory's vegetation management program was instituted in its current form in 1992 in response to the Oakland/Berkeley East Bay Hills Fire of 1991. Under the program, on-site vegetation is managed to minimize potential wildland fire damage to structures through an annual program of removing tree limbs a minimum of six to eight feet from the ground, mowing or grazing grasses, removing all brush from most vegetated areas of the site, and planting ornamental species near buildings for fire safety. The vegetation management program also encourages use of native plants. Under the program, the Lab has removed a number of invasive exotic plants, including French broom, artichoke thistle, cape ivy, and pampas grass. Eucalyptus and other tree stands across the site are continually removed or thinned and native grasses are used in erosion control. Trees at the Laboratory are also managed as part of a larger urban forest, with thinning and replacements made to promote long-term health of the stands.

III.B.2.7 Research

The Laboratory's principal role for DOE is to promote fundamental science, including developing powerful experimental and computational systems for exploring properties of matter, deepening understanding of molecular interactions and synthesis, and gaining insights into biological molecules, cells, and tissues. The Laboratory is a major contributor of research on energy resources, including efficient energy use, the earth's structure and energy reservoirs, fusion, and cleaner combustion of fuels, as well as environmental research, subsurface contaminant transport, bioremediation, and indoor air quality. Research programs include computational research, information technologies, chemical sciences, materials sciences, physical biosciences, earth sciences, life sciences, accelerator and fusion research, nuclear science, and basic physics. User facilities include the Advanced Light Source, National Energy Research Scientific Computing Center, National Center for Electron Microscopy, and Energy Sciences Network (ESnet). The Laboratory's multidisciplinary research environment and unique location serve to strengthen partnerships with industry, universities, and government laboratories. Partnerships include the Joint Genome Institute and programs in advanced accelerator and detector systems, x-ray lithography, high-speed networking and computer architectures, building and lighting systems, and science education.

During the 20-year term of the 2006 LRDP, Berkeley Lab would continue to engage in scientific research and activities on the main hill site. This work would include continued bench top laboratory research; employment of large scientific equipment, such as accelerators, lasers, microscopes, sensors, detectors, fabricators, biotechnical equipment, supercomputers, and a variety of other machinery; field work to collect data, observe and interact in remote or natural settings; and collaborative assistance to other institutions and organizations.

LBNL researchers also participate in various activities at off-site locations, including field research. Prior to its initiation, such research is evaluated by the Laboratory to determine whether any significant environmental effects could occur, as well as whether such activities comply with all applicable state and federal regulations, laws, and CEQA. Among such off-site activities that might occur in California and continue over the span of the 2006 LRDP are materials properties investigations at the Low-Background Facility at the Oroville Dam; geophysics field research at oil and gas fields and at the Richmond Field Station of the University of California; research into indoor air pollutants and outdoor emissions, energy-efficient windows, geothermal and fossil energy resources, and wetlands at various locations; and field-testing of bioremediation methods in already contaminated environments, such as municipal landfills.[13]

Lab staff provide administrative and support services in areas including engineering, environmental, health and safety programs, facilities maintenance and planning, public and community affairs, animal care, site administration, information technology, and finance.

III.B.3 1987 Long Range Development Plan

Development of the main LBNL site is currently guided by the 1987 LRDP. If the 2006 LRDP is approved, it would replace the 1987 LRDP. The environmental effects of growth under the 1987 LRDP were analyzed in a corresponding *Site Development Plan Draft and Final Environmental Impact Report.* Additional CEQA documents that analyzed the effects of incremental growth at the LBNL site were adopted in 1992 and 1997. These are collectively known as the 1987 Long Range Development Plan (1987 LRDP) EIR, as amended:

- *Site Development Plan EIR*, August 1987 (State Clearinghouse No. [19]85112610);
- *Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Lawrence Berkeley National Laboratory* (Supplemental EIR), September 1992 (State Clearinghouse No. [19]91093068); and
- *Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Lawrence Berkeley National Laboratory* (Supplemental EIR Addendum), September 1997 (State Clearinghouse No. [19]91093068).

Proposed projects tiered from the 1987 LRDP EIR, as amended, were analyzed in accordance with Sections 15152 and 15168 of the CEQA Guidelines and Public Resource Code Section 21094. The 1987 LRDP EIR, as amended, is a Program EIR, prepared pursuant to Section 15168 of the CEQA Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.). The 1987 LRDP EIR, as amended, analyzes full implementation of uses and physical development proposed under the 1987 LRDP through the year “20XX,” which is an indeterminate horizon year flexibly projected to occur within the current century. Measures are identified in the 1987 LRDP EIR, as amended, to mitigate the significant adverse project and cumulative impacts associated with that growth.

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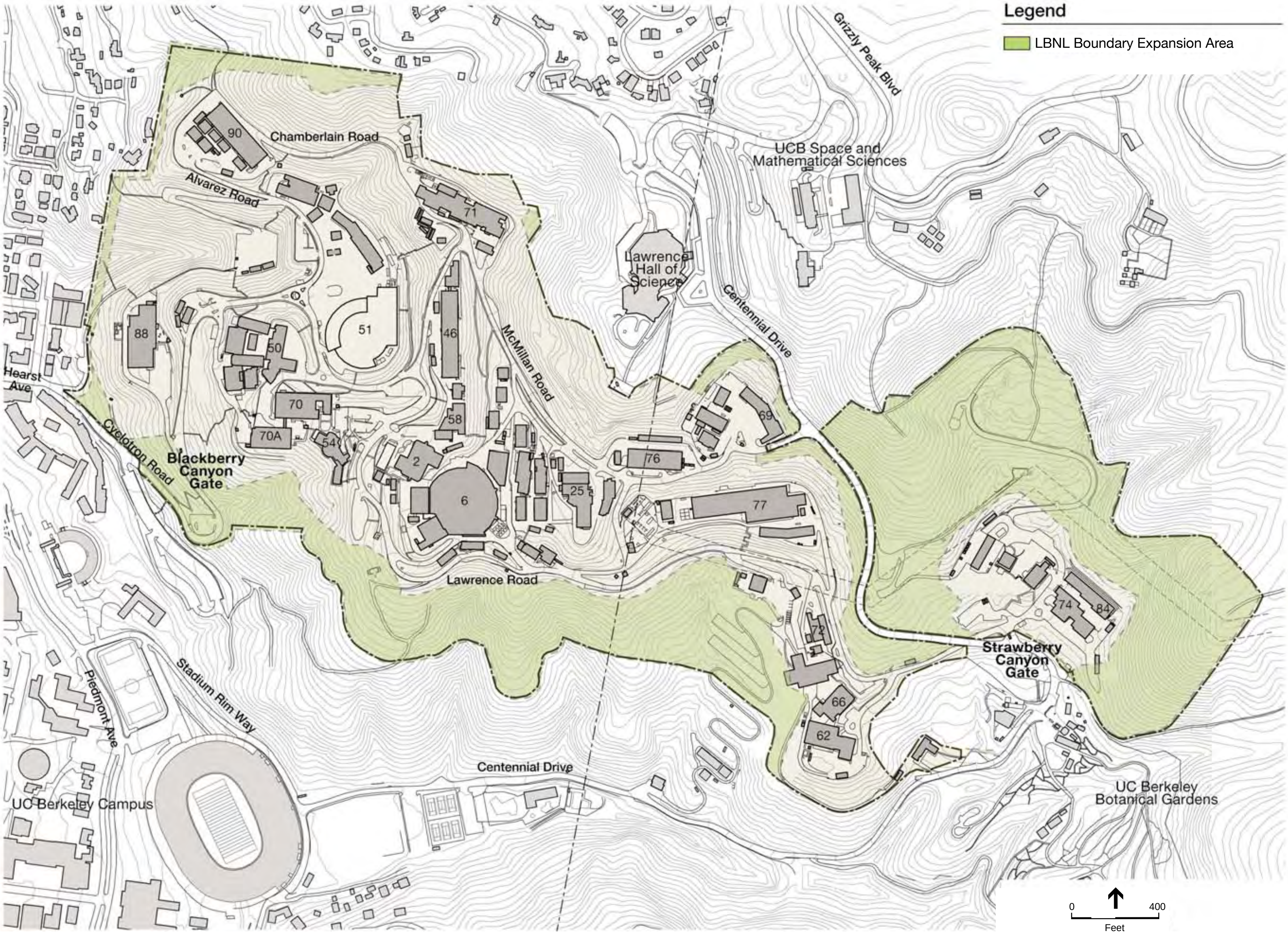
[13] Assessment of the environmental impacts of University of California activities conducted outside of California is not required under CEQA provided that such activities would be subject to review under the National Environmental Policy Act (NEPA) or a similar law of the state involved. Public Resources Code Section 21080(b)(14); CEQA Guidelines Section 15277. The one notable exception to this applies to emissions or discharges that would have a significant effect on the environment of California. Public Resources Code Section 21080(b)(14); CEQA Guidelines Section 15277. LBNL or other institutions conduct such reviews of projects taking place outside of California in which LBNL researchers are involved. To date, none of these projects has raised the possibility of a reasonably foreseeable significant effect on the California environment, and CEQA review has not been required.

Since the 1987 LRDP was published, Berkeley Lab has increased in size from 134 acres to 202 acres, primarily due to the transfer of two areas of UC Regents land to LBNL from UC Berkeley in order to permit Berkeley Lab to more effectively manage vegetation at its perimeter for wildland fire control. The majority of this approximately 68 acres has been added in two general areas (see Figure III-4). The first area is along the southern and western perimeter of the Lab where LBNL adjoins the UC Berkeley campus; here, the Lab has assumed jurisdiction over a portion of undeveloped and developed land ranging between approximately 20 and 500 feet in width. This land extends north of Building 71, westerly around the perimeter of the Building 90 area, south of Building 88, immediately west of the horseshoe curve of Cyclotron Road at the Lab’s Blackberry entrance, and across the Berkeley-Oakland border to the curve of Lee Road around the southern edge of Building 62. The second area is at the eastern edge of the Lab, where LBNL has assumed control of an approximately 1,000-foot perimeter of generally undeveloped land to the north and east of the Lab’s Strawberry Cluster (Buildings 74, 83, 84, 85, and 85B). In addition, LBNL has jurisdiction of land on both sides of Centennial Drive where it ascends towards the Lawrence Hall of Science (excepting a five-foot maintenance zone on each side of the road, which is retained by UC Berkeley). Although it passes through the Lab’s perimeter, Centennial Drive crosses above internal Lab roadways via an overpass and thus does not provide uncontrolled access to LBNL.[14]

The 1987 LRDP described growth and development that could be reasonably projected at the time of that plan’s preparation. The 1987 LRDP accommodated an ADP of 4,750 as well as 1,996,200 gsf of building space at the main LBNL hill site, consistent with LRDP policies (see Figure III-5). As stated above, the EIR for the 1987 LRDP, as later amended, assumed that these conditions would occur by an unspecified date in the 21st century (identified as “20XX” in the document). Major buildings developed at LBNL under the 1987 LRDP include Buildings 84 and 85, in addition to two approved projects not yet constructed at the time of issuance of the Notice of Preparation (NOP) for this 2006 LRDP EIR – the Molecular Foundry and Building 49. The Molecular Foundry has been completed and began preliminary operations in early 2006. There are no current plans to move forward with Building 49 during the term of the 2006 LRDP planning period.

The 1987 LRDP identified general land use categories for LBNL activities on the main hill site and for off-site locations including office, laboratory, shop, and storage areas. The 1987 LRDP focused on several core planning principles, the most central of which was the consolidation of related research activities into “functional planning areas” designed to enhance interaction and efficiency at LBNL’s hill site. The functional planning areas were organized along an east-west circulation and utilities axis, which generally extends from the 88-Inch Cyclotron Research Area

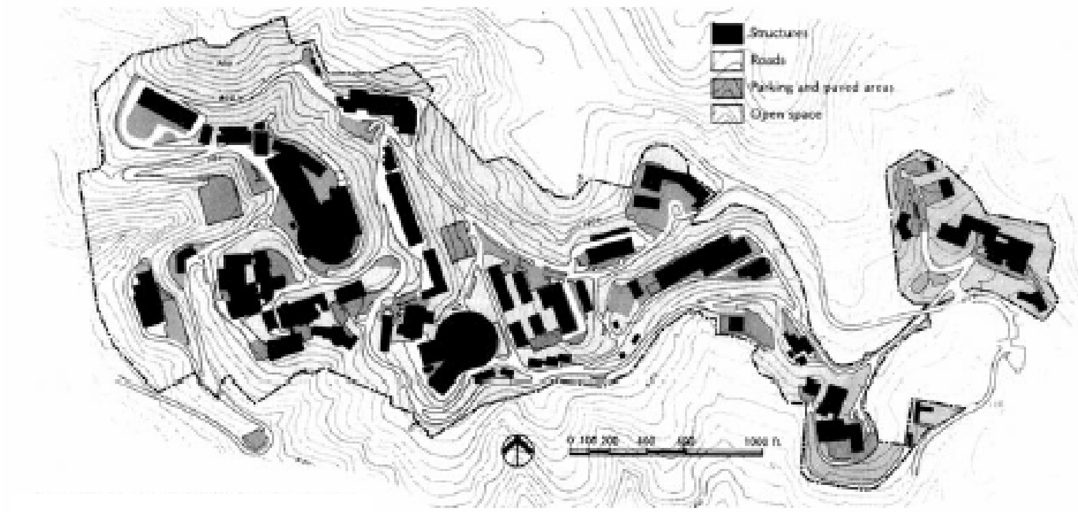
14 Berkeley Lab is fenced for security and controlled access. As occurred under the 1987 LRDP, it is possible following adoption of the 2006 LRDP that there might be changes in operational and jurisdictional control over some parts of the Berkeley Lab site; for example, it is possible that a facility might be proposed to be jointly operated by UC Berkeley and the Lab. If such changes are proposed, the location of boundary and security fencing may change accordingly. No such joint operations or changes are currently proposed, although it is possible that joint operation will be proposed for the Helios Research Facility, which is currently anticipated to be proposed and reviewed under CEQA in 2008.



SOURCE: LBNL, 2006

LBNL 2006 Long Range Development Plan . 201074

Figure III-4
Areas Added to LBNL Since 1987 LRDP



LBNL LRDP EIR / 201074 ■
Figure III-5
Land Use Plan from 1987 LRDP

to the Life Sciences Research Area. Natural buffer zones were used to separate the planning areas and provide screening of LBNL from adjacent communities. The functional areas depicted in the 1987 LRDP are as follows:

- **88-Inch Cyclotron Research Area**, including the building housing this accelerator, beam halls, and offices; cooling towers and utility buildings; and a parking lot.
- **Central Research and Administration Area**, housing research scientists, most of the management functions of the Laboratory, centralized computers, and communications. Most visitors come to this location, which contains the cafeteria, an auditorium, and conference rooms.
- **Bevalac Accelerator Complex**, located near the Administration Area, which at the time of the 1987 LRDP accommodated this accelerator, with offices for scientists and engineers.
- **Light Source Research and Engineering Area**, including the Advanced Materials Laboratory and engineering support areas.
- **Shop and Support Facilities Area**, including engineering shops and material management.
- **Materials and Chemistry Research Area**, containing laboratories, the Surface Science and Catalysis Laboratory, and the National Center for Electron Microscopy.
- **Life Sciences Research Area**, containing biomedical sciences research facilities.

The 1987 LRDP proposed concentration of new development on infill sites at the core of the Lab, allowing a greater percentage of the site perimeter to be reserved as open space. The 1987 LRDP also reinforced the importance of landscape criteria and planning.

III.B.4 Changes in Baseline Conditions Since 2003

The CEQA Guidelines (Section 15125) require that an EIR describe the environmental conditions in the project vicinity as they existed at the time the Notice of Preparation (NOP) for the project was published. The Guidelines state that "this environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." LBNL issued the NOP for the proposed 2006 LRDP on October 28, 2003, and therefore this EIR uses 2003 as the baseline year for evaluating the project's impacts on its environmental setting. To provide a conservative analysis, however, this EIR selectively uses more recent (post-2003) data, where appropriate and where using such data does not make the analysis less conservative. This section identifies the incremental changes that have occurred at LBNL between commencement of CEQA analysis of the proposed 2006 LRDP in 2003 and the present.

III.B.4.1 Population

Since the Notice of Preparation (NOP) was issued for this EIR in 2003, the Lab's adjusted daily population (ADP) peaked at approximately 4,650 in 2004 and has since declined to about 4,515 in 2006. Since 2003, there has been a decrease in Lab staff, with full-time equivalent staff levels having declined by about 10 percent. However, this decrease has been offset by an increase in annual visitors such that the ADP has increased, but only slightly – by approximately 3 percent. This short-term change in ADP is considered to be a part of the normal fluctuation in the Lab's population cycle and, for purposes of impact analysis, has not resulted in a meaningful change, compared with the 2003 baseline setting.

III.B.4.2 Building Space

Construction and Demolition

Since the NOP was issued in 2003, the Molecular Foundry was approved under the 1987 LRDP and LRDP EIR, as amended, and has been constructed and began preliminary operations in early 2006.[15] The Negative Declaration for the Molecular Foundry did not identify any significant impacts from either construction or anticipated operation of that facility that could not be mitigated to a less than significant level. Although operational, the Molecular Foundry is included as part of the 2006 LRDP "project" that is analyzed in this EIR, because the building was not operating when the EIR analysis was begun in 2003.

Minor new projects have also been developed on the hill site: in 2003, two small construction projects were undertaken that added approximately 2,150 gsf to the main hill site. Building 71T, the Window Test Facility, is a 950-gross-square-foot structure that allows for installation and testing of various building window materials. The second construction was an addition of 1,200 gsf of laboratory space inside the existing Building 64 high bay. These projects, tiered from the 1987 LRDP EIR, as amended, have likewise resulted in no meaningful changes to the 2003 setting.

[15] CEQA documentation for this facility was included in the *Final Tiered Initial Study Checklist and Mitigated Negative Declaration for the Construction and Operation of the Molecular Foundry at Ernest Orlando Lawrence Berkeley National Laboratory, Berkeley, California*, State Clearinghouse No. 2002122051 (April 2003).

Berkeley Lab also demolished a small number of structures between 2003 and 2006, removing a total of approximately 50,000 gsf in building space on the hill site (most of which was included in Building 51B, the External Particle Beam Hall) in projects undertaken under the 1987 LRDP and LRDP EIR, as amended. However, because they existed when the analysis was undertaken for this EIR, these facilities are considered as part of the baseline setting. Appendix C lists facilities demolished since preparation of the NOP.

Approved Projects

Building 49 Office Building

In addition to the Molecular Foundry, discussed above, another project has been approved under the 1987 LRDP and LRDP EIR, as amended since issuance of the 2003 NOP – an office building known as Building 49.[16] Building 49 received CEQA and design approvals from the UC Regents in 2003 with construction initially scheduled to begin in 2004. However, there are no current plans to move forward with this project during the 2006 LRDP planning period, and it is not considered reasonably foreseeable and therefore has not been included in this EIR analysis.

Demolition of Building 51 Complex

On October 21, 2005, Berkeley Lab circulated for public review a Draft EIR for the demolition and removal of the Building 51 complex, including the Bevatron, a retired particle accelerator and the concrete blocks and building shell surrounding it. This EIR was tiered from the 1987 LRDP EIR, as amended. Certification of the Building 51 (Bevatron) EIR and approval of the demolition project are anticipated to be considered in early 2007. The Bevatron removal would likely take place between approximately 2008 and 2012 or later. For purposes of this EIR, the Building 51 complex is considered part of the baseline setting because the buildings were in place when the EIR analysis was begun. Building 51 complex demolition activities are therefore included as part of the project analyzed in this EIR. In general, this results in a more conservative analysis, because it burdens the 2006 LRDP with impacts from a separate project that may proceed independently of the 2006 LRDP program.[17]

The approximately 180-foot-diameter Bevatron was constructed as a proton synchrotron – a particle accelerator that accelerated protons within a beam pipe to near the speed of light. During its operation from 1954 until 1993, the Bevatron was among the world's leading accelerators. Building 51 is a large, approximately 126,500-gross-square-foot steel-frame shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, ship, and office functions. Under the proposed Bevatron demolition project, the Bevatron apparatus would be disassembled, Building 51 and the foundation underneath the building demolished, and the resulting debris and other materials removed. The site would then be backfilled, and the fill compacted and leveled. There are no current plans for future development of the underlying site. Demolition would entail the removal of approximately 22,000 to 26,000 tons of reinforced

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[16] CEQA documentation for Building 49 was undertaken in the *Construction and Operation of the Building 49 Project Final Environmental Impact Report*, State Clearinghouse No. 2003062097 (December 2003).

[17] Bevatron Demolition CEQA and NEPA documents are available at the City of Berkeley Main Public Library and on-line at http://www.lbl.gov/Community/env-rev-docs.html

concrete, structural steel, siding, glass, and other building materials; 12,000 to 16,000 tons of reinforced concrete shielding blocks; and 12,000 to 15,000 tons of Bevatron materials, mostly metals, such as yokes, support steel and equipment.

Animal Care Facility

In August 2005, a categorical exemption was prepared for construction of the Animal Care Facility, a 7,100-gross-square-foot structure that will house mice used in research and that are currently housed in Building 74. Construction of this project is now under way and is expected to be completed in mid-2007. Although the project is tiered from the 1987 LRDP, as amended, building space associated with this small structure is included as part of the project in this EIR analysis.

Planned Projects

Building space for two planned projects under consideration – the Guest House and the User Support Building – are included as part of the 2006 LRDP evaluated in this EIR. However, the User Support Building has been made the subject of a mitigated negative declaration, pursuant to the 1987 LRDP and the 1987 LRDP EIR, as amended, that was circulated for public review in late 2006 and will be presented to The Regents for consideration in mid-January 2007. It is anticipated that the Guest House will also undergo a separate CEQA analysis pursuant to the 1987 LRDP and LRDP EIR, as amended (see descriptions below). Nevertheless, both projects are included within this analysis in order to provide a complete disclosure of environmental impacts of actions since the 2003 baseline date for the analysis. These projects are consistent with the Illustrative Development Scenario (see p. III-37) and are described briefly as follows.

- **User Support Building:** This proposed three-story, approximately 30,000-gross-square-foot building would consist of assembly space, support laboratories, and offices in support of the Advanced Light Source user facility at LBNL. An Initial Study/Negative Declaration for CEQA and a NEPA Categorical Exclusion were prepared and circulated November 2006. At that time, a NEPA categorical exclusion was adopted for this project by DOE. If approved, this building would occupy space currently occupied by Building 10, which is obsolete and would be demolished. Demolition and construction would take place between early 2008 and mid-2010.[18]

- **Guest House:** This proposed three-story, approximately 25,000-gross-square-foot building would hold up to 120 beds for visiting researchers and other guests of LBNL. An Initial Study/Negative Declaration is expected to be prepared and circulated in winter 2006 – 2007. If this project were approved, construction would take place between late 2007 and early 2009. The Guest House would be constructed near the Advanced Light Source, the Lab's largest user facility. It would use existing utilities infrastructure in the vicinity.

[18] User Support Building CEQA documents are available at the City of Berkeley Main Public Library and on-line at http://www.lbl.gov/Community/env-rev-docs.html

Two additional projects are anticipated to be under consideration at some point in the future pursuant to the 2006 LRDP EIR and are included as part of the reasonably foreseeable future development under the 2006 LRDP that is evaluated in this EIR. These projects are the Computational Research and Theory (CRT) Building and the Helios Research Facility. The planning, design, and proposed funding for these projects has not yet proceeded to the point where they can be described in substantial detail, or proposed as specific projects pursuant to the 2006 LRDP. They can be described briefly as follows:

- **Computational Research and Theory (CRT) Building:** As currently projected, the CRT Building would likely be proposed as a six-story, 165,000-gross-square-foot building near the Blackberry Canyon Gate entrance to the Lab. It would provide high-end computing floor space and accompanying office space to support the Lab's National Energy Research Scientific Computing (NERSC) Center, which is currently operating within the confines of an off-site leased site in Oakland. It is currently anticipated that a tiered CEQA review for this facility would be conducted sometime around mid- to late 2007. (See Appendix D for further details.)

- **Helios Research Facility:** As currently projected, the Helios Research Facility building would likely be proposed as a four-story, 100,000-gross-square-foot laboratory building constructed south of existing LBNL Buildings 66 and 62 or in a location west of Buildings 72 and 67. The goal of the Helios project is to accelerate the development of renewable and sustainable sources of energy using sunlight by developing fundamentally new and optimized materials for use in collectors, efficient processing steps, and energy handling. It is currently anticipated that a tiered CEQA review for this facility would be conducted in 2008. (See Appendix D for further details.)

III.B.4.3 Leased Space

Since 2003, LBNL has terminated leases at two locations in the City of Berkeley and has added three leases in the cities of Berkeley, Walnut Creek, and Richmond for a net addition of approximately 44,000 square feet. This represents about 12 percent of the Lab's overall off-site leased space of approximately 340,000 square feet. Appendix C lists currently off-site leased facilities.

III.B.4.4 Traffic Conditions

To ensure that the previously counted turning movement volumes (conducted in 2002 – 2003) adequately represent current conditions, new traffic counts were undertaken at each of the study intersections in October 2006 (when UC Berkeley and City of Berkeley schools were in session). In general, the volumes counted in 2006 were lower than those counted previously, with 18 of 20 intersections having current volumes in both the a.m. and p.m. peak hours that were between 3 percent and 39 percent lower than those counted earlier. The average decline was 14 percent in the morning and 13 percent in the afternoon. Exceptions were at Centennial/Stadium Rim Way (a.m. peak hour, 5-percent increase, but overall volumes remain very low), and Dwight/Piedmont-Warring and College/Bancroft (p.m. peak hour, 9-percent and 4-percent increases, respectively, with little or no increase in the conflicting movements that determine level of service). At the Panoramic Way/Canyon Road/Stadium Rim Way intersection, a.m. peak-hour volumes were essentially unchanged (although p.m. peak-hour volumes declined by 20 percent between the 2003 and 2006 counts). All intersections where volumes increased between the prior counts and the 2006 counts currently operate (and will operate in the future) at good levels of service (LOS B or C). The October 2006 counts were also compared to the volumes counted for the UC Berkeley Southeast Campus Integrated Projects (SCIP) EIR (taken in January 2006). Once again, the current counts are lower, except at Centennial/Stadium Rim Way (a.m. peak hour, increase of 33 percent but, as stated above, the overall volume was low and the level of service remained good) and Bancroft/Gayley-Piedmont (p.m. peak hour, increase of 5 percent, but there was a decrease in conflicting movements that determine level of service).

III.C. Institutional Approach, Principles, and Strategies

III.C.1 Project Objectives

The proposed 2006 LRDP outlines the following approach to revitalizing the facilities and infrastructure at the main site:

- Strengthen and expand existing research programs to sustain and grow Berkeley Lab's role as a national research institution;
- Expand partnerships and collaborations to enhance Berkeley Lab's scientific and technical base;
- Provide flexibility to return staff from its off-site facilities leased in Berkeley and Oakland to the main site in order to enhance collaboration, productivity, and efficiency;
- Expand the capacity of existing high-demand advanced facilities and provide broader functionality;
- Rehabilitate facilities that have outlived their intended purpose and can be cost-effectively adapted for use in new regions of scientific discovery;
- Replace single-purpose facilities with new facilities programmed to accommodate multiple disciplines with advanced infrastructure suitable for future scientific endeavors; and
- Construct new scientific facilities to support future research initiatives and continued growth in existing programs.

III.C.2 Principles and Strategies

The 2006 LRDP also includes a number of principles and strategies intended to guide future development at the Lab. A separate, companion document, the Berkeley Lab Design Guidelines, will provide direction for physical development under the 2006 LRDP. These proposed Design Guidelines are proposed to be adopted by the Lab following The Regents approval of the 2006 LRDP. These principles, strategies, and design guidelines are listed in Appendix B and are referred to in the Project Description and the various technical sections of this EIR, as appropriate.

III.D. Proposed Project

This EIR evaluates the proposed 2006 LRDP, including a project variant in which most off-site Lab employees would be relocated to the hill site. In addition, for purposes of describing specific physical impacts that could reasonably be expected to occur as a result of development anticipated pursuant to the 2006 LRDP, this EIR evaluates an Illustrative Development Scenario, which represents a reasonable outcome of 2006 LRDP implementation.

If approved, the proposed Draft 2006 LRDP would become Final and would replace the 1987 LRDP. The 2006 LRDP would provide guidance for continuing and projected development and activities at the main LBNL site, at space on the UC Berkeley campus, and at off-site leased locations, assuming a horizon year of 2025. Under the proposed 2006 LRDP, the total research and support space area at the main LBNL hill site would increase to as much as 2.42 million square feet. The 2006 LRDP does not assume an increase in space occupied on the UC Berkeley campus, but allows for reallocation of that space among different buildings; it also provides that off-site commercial leases would depend on specific Laboratory needs and market conditions. The ADP would also increase 22.8 percent from the baseline 4,375 to 5,375. This translates into an average annual growth rate of less than one-half of the overall 2.5-percent annual growth since adoption of the 1987 LRDP. Table III-1 presents baseline and future population and space projections.

TABLE III-1
BASELINE AND FUTURE POPULATION AND SPACE PROJECTIONS (approx.)

	Baseline (2003)	Future (2025)	Change (2025)
Adjusted Daily Population (ADP)			
LBNL Hill Site	3,650	4,650	+1,000
UC Berkeley Campus	350	350	0
Leased Space[1]	375	375	0
Total Lab Population	**4,375**	**5,375**	**+1,000**
Building Space (gsf)			
LBNL Hill Site	1,760,000	2,420,000	+660,000[2]
UCB Campus Space (nsf)[3]	100,000	100,000	0
Leased Space[1]	338,000	338,000	0
Total Occupied Space	**2,198,000**	**2,858,000**	**660,000**

gsf – gross square feet; nsf – net square feet

1 "Leased space" includes the Lab's warehouse in west Berkeley, and leased office and research space in downtown and other areas of Berkeley, downtown Oakland, Walnut Creek, and various other locations. See text above.

2 Change in building space is net value:320,000 gsf of demolished space subtracted from overall space construction figure of980,000 gsf occupiable space would result in 660,000 gsf of new occupiable space. Two projects—the Molecular Foundry and Building 49—have been approved under the 1987 LRDP and LRDP EIR. The Molecular Foundry has since been constructed, but Building 49 is indefinitely on hold. For purposes of analysis, the Molecular Foundry—approximately 95,000 gsf—is counted as part of the project to be developed and not as part of the baseline setting.

3 Space occupied by LBNL on the UC Berkeley campus is variable; the amount of space in the table is the maximum that LBNL uses.

As shown in Table III-1, it is anticipated that the increase in ADP and building space under the 2006 LRDP would take place on the Lab's main hill site. Off-site ADP and building space is expected to remain roughly the same as at present, although the specific locations and the precise amount of space occupied would likely vary somewhat over time.

The review of the proposed project in this EIR includes two projects that have been approved and constructed pursuant to the 1987 LRDP EIR, as amended: the Molecular Foundry (S-11) and the Animal Care Facility (S-15). This EIR also evaluates several projects that are either currently under consideration and undergoing CEQA review or anticipated to undergo CEQA review in the near future, or likely to be under consideration at some point in the future. These projects are the CRT Building (S-1), the Helios Research Facility (S-12), the Guest House (S-5), the User Support Building (S-6), and the Bevatron demolition project. More details regarding all of these projects are included in this chapter in Section III.B.4, "Changes in Baseline Conditions Since 2003" and in Appendix D.

As explained in Section III.A, above, the scope of potential development on the main hill site pursuant to the 2006 LRDP has been reduced since the issuance of the Notice of Preparation for this EIR. The NOP anticipated a possible maximum of 1,240,000 gsf of new research and support space construction, and 440,000 gsf of demolition, leading to up to 800,000 net new gsf of occupiable space. Since the release of the NOP, however, it has become apparent to Lab staff that DOE funding priorities may limit the scope of development pursuant to the 2006 LRDP, and while it is possible that other funding sources may make up some of this difference, this reallocation of DOE priority is likely to decrease the amount of development on the main hill site. In addition, and more importantly, substantial concerns were raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed on the main hill site. For both of these reasons, the Lab determined that the 2006 LRDP and the proposed project presented in this EIR should be reduced in scope to 980,000 gsf of new occupiable building space construction, with 320,000 gsf of demolition for a net total of 660,000 gsf of new occupiable space. This is a reduction of approximately 21 percent in the amount of possible new construction of occupiable space under the 2006 LRDP, and a reduction of 17.5 percent in the amount of possible net new occupiable space.

III.D.1 Project Variant

The project variant is analyzed in the event that Berkeley Lab management decides during the course of the planning period to consolidate most of its personnel on the main hill site. Under this scenario, up to approximately 350 employees currently working off-site would be transferred to the main hill site and approximately 25 LBNL staff would continue to work off of the Lab's main hill site or the UC Berkeley campus. These remaining off-site personnel would likely include warehouse staff and personnel based in Walnut Creek, California, and Washington, D.C., for a total of approximately 25 people (see Table III-2). Under the variant, space projections on the main hill site would not be expected to change, although some administrative office space may be used more intensively. In addition, the number of parking spaces provided to Laboratory employees would not be increased to accommodate this additional hill staff.

TABLE III-2
PROJECT VARIANT: HILL SITE CONSOLIDATION
BASELINE AND FUTURE POPULATION AND SPACE PROJECTIONS (approx.)

	Baseline (2003)	Future (2025)	Change (2025)
Adjusted Daily Population (ADP)			
LBNL Hill Site	3,650	5,000	+1,350
UCB Campus Space	350	350	0
Leased Space[1]	375	25	-350
Total Lab Population	**4,375**	**5,375**	**+1,000**
Building Space (gsf)			
LBNL Hill Site	1,760,000	2,420,000	+660,000[2]
UCB Campus Space (nsf)[3]	100,000	100,000	0
Leased Space[1]	338,000	126,000	-212,000
Total Occupied Space	**2,198,000**	**2,646,000**	**+448,000**

gsf – gross square feet; nsf – net square feet

1 "Leased space" includes the Lab's warehouse and leased space in downtown Berkeley, downtown Oakland, Walnut Creek, and various other locations. See text above.

2 Change in building space is net value: 320,000 gsf of demolished space subtracted from overall space construction figure of 980,000 gsf occupiable space would result in 660,000 gsf of new occupiable space. Two projects—the Molecular Foundry and Building 49—have been approved under the 1987 LRDP and LRDP EIR. The Molecular Foundry has since been constructed, but Building 49 is indefinitely on hold. For purposes of analysis, the Molecular Foundry—approximately 95,000 gsf—is counted as part of the project to be developed and not as part of the baseline setting.

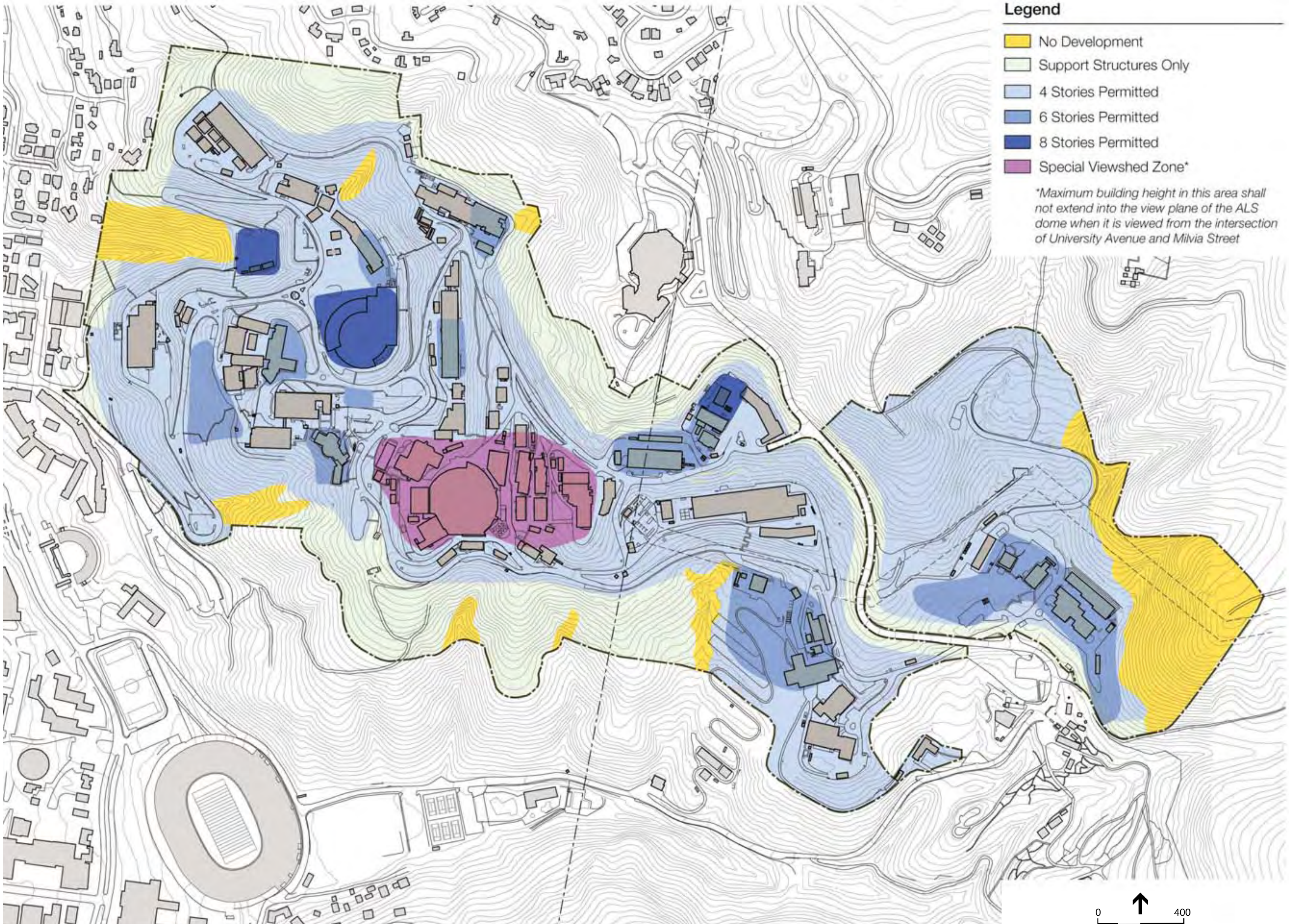
3 Space occupied by LBNL on the UC Berkeley campus is variable; the amount of space in the table is the maximum that LBNL uses.

III.D.2 Height Zones

Due to the combination of geomorphic features, screening trees and terrain, built and natural elements, and availability to off-site viewpoints, the Lab's 202-acre hill site hosts a variety of opportunities and constraints for building heights. Chief among these opportunities and constraints are aesthetic considerations involving how different building heights and scales might affect the visual character of the Lab as viewed from important off-site locations. Accordingly, and to support the aesthetic principles put forth in the LBNL Design Guidelines, Figure III-6 depicts a Height Zoning Map that would guide placement and height of buildings under the 2006 LRDP. The proposed Design Guidelines are a companion document to the 2006 LRDP and will provide direction for physical development pursuant to the LRDP. The Design Guidelines are set forth in Appendix B to this EIR, and are proposed to be adopted by the Lab following The Regents approval of the 2006 LRDP.

III.D.3 Land Use Plan

The 2006 LRDP Land Use Plan (see Figure III-3, p. III-7) would establish four land use zones for the Lab's hill site. It has been configured in accordance with five key objectives that derive from site conditions, the Lab's scientific mission, the heritage and success of team science, and the continuing desire for intense collaboration among various users. In conjunction with the LBNL Design Guidelines and land use objectives and with avoidance of fixed land use constraints (such as important habitat or seismic zones), the Land Use Plan would guide siting decisions for future buildings and support facilities.



SOURCE: LBNL, 2006

LBNL 2006 Long Range Development Plan . 201074

Figure III-6
Building Height Map

III.D.3.1 Land Use Zones

The 2006 LRDP provides a new framework for development of the main LBNL site by identifying four zones of development intensity. These land use zones are (1) Research and Academic, (2) Central Commons, (3) Support Services, and (4) Perimeter Open Space. These land use zones replace the seven functional zones identified in the 1987 LRDP.

It is not possible to anticipate all specific facilities requirements or future funding availability for the research programs that would be developed to address emerging scientific missions. Therefore, specific facility siting and design decisions are not made in the LRDP. Rather, the Land Use Plan identifies the above four land use zones that would guide development, and includes policy language to direct the form of new buildings. It also describes the land uses that are allowed in each zone.

Research and Academic

The vast majority of developable sites at the Lab are planned for research and academic uses. Within these areas all typical Lab research facilities as well as supporting uses such as parking, circulation and administrative uses would be located. Research space would include laboratories, offices, and specially outfitted areas such as accelerator facilities. Research space would also include associated support activity areas such as cold rooms, clean rooms, glass wash, microscopy, and instrument rooms. Non-research uses would be permitted, but not promoted; instead, such uses would be encouraged to locate in the Central Commons or Support Services zones (see below). Under the LRDP, priority would be given to siting new facilities where service infrastructure and roads are in place. The Research and Academic zone would include approximately 121 acres, largely encompassing or adjacent to already developed portions of the main hill site.

Central Commons

As a subset of the Research and Academic zone, the Central Commons would be the main location of dining and gathering uses, as well as visitor accommodations. This approximately six-acre “heart” of the Lab would be the hill site’s primary gathering and event area. While academic and research functions would be permitted, this zone would be primarily reserved for common, shared uses. By concentrating gathering, event, and dining uses in this area, the Lab would seek to achieve a greater sense of “campus” and of interaction among researchers, academics, visitors, students and staff, thus supporting the “team science” concept that is at the heart of the Lab’s culture.

Support Services

The Support Services zone would provide a central location for the Lab’s support functions, such as shops, environmental services, corporation yards, and maintenance. Facilities maintenance and other operations and logistical spaces would provide for operating, maintaining, and repairing the Lab’s buildings and grounds. Such spaces would include wood, metal, machine, and paint shops; materials delivery and storage areas; construction staging and laydown areas; vehicle and equipment depots; utility equipment and buildings; waste handling facilities; and cleaning facilities. While academic and research functions would be permitted in this zone, it generally would be reserved for non-research uses so that efficiencies can be achieved in the organization and management of critical Lab support services.

Perimeter Open Space

The Perimeter Open Space land use zone would encompass the remaining areas of the Lab's hill site and indicate areas of the Lab where future development would be primarily reserved for minor maintenance or support structures or paths and where the open, wooded, or grassland character of the hillside site would be retained to the extent feasible. Much of the Perimeter Open Space zone would comprise parts of the site where development potential is restricted due to constraints such as habitat quality and vegetation, seismic risk, utility easements, adjacent uses, and similar limitations. Throughout these areas various maintenance activities would continue to preserve and enhance appropriate vegetation characteristics.

Table III-3 summarizes proposed land uses at the main site by total area and percentage.

TABLE III-3
PROPOSED LAND USE PLAN AREA CALCULATIONS

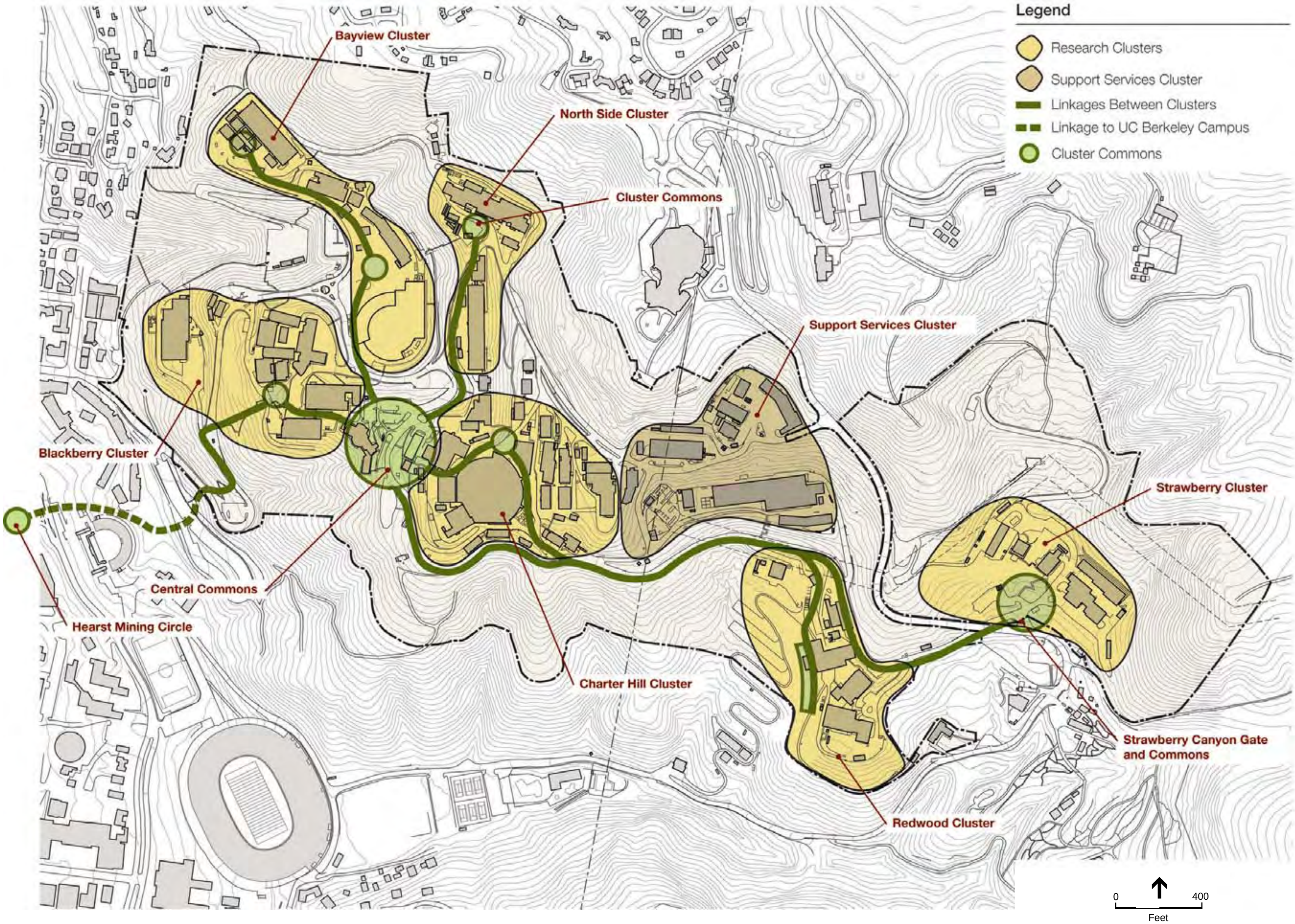
Land Use Zone	Area Acres	Percentage Of Developable	Percentage Of Total
Research and Academic	121	83%	60%
Central Commons	6	4%	3%
Support Services	19	13%	9%
Total Developable Area	**146**	**100%**	**72%**
Perimeter Open Space	56		28%
Total Berkeley Lab Area	**202**		100%

SOURCE: LBNL

III.D.3.2 Development Clusters

The LRDP calls for developing clusters of research and academic uses close to one another and creating usable, attractive plazas and other open spaces that would function as “commons” for nearby buildings. This clustering of development would allow the Lab to evolve into a more campus-like setting, fostering interaction and informal encounters among Lab staff and supporting the “team science” heritage of the Lab.

As shown on Figure III-7, the LRDP's Development Framework identifies six research clusters and one support services cluster focused around existing facilities. Each cluster corresponds to a collection of related facilities. Within each research cluster, a major outdoor use area would be encouraged, probably most often through the relocation of existing surface parking or temporary buildings. The specific configuration and design of new development within the research and academic zone would be guided by the LBNL Design Guidelines.



SOURCE: LBNL, 2006

LBNL 2006 Long Range Development Plan . 201074

Figure III-7
Development Framework

III.D.4 Transportation, Circulation, and Parking

Table III-4 lists proposed roadway improvements. See Figure III-9, the Illustrative Development Scenario, p. III-37, and 2006 LRDP Figure 3.20, Vehicle Circulation and Parking Framework, and related description for further discussion of proposed circulation and parking development under the proposed project.

TABLE III-4
PROPOSED ROAD IMPROVEMENTS

Road No.	Location	Length	Notes
R-1	Life Sciences Exit	800 feet	New limited access entry egress. Includes retaining wall.
R-2	Poultry Husbandry Area	1,800 feet	New limited access entry egress. Includes retaining wall.
R-3	Firehouse turn	600 feet	Minimizes traffic through work zone; improves traffic safety and overall transportation efficiency. Vertical grade and turning radius improvements. Includes retaining wall.
R-4	ALS area	800 feet	Minimizes traffic through work zone. Alignment change. Includes retaining wall.
R-5	Building 71	900 feet	Minimizes traffic through work zone. Includes retaining wall.
R-6	ALS area	300 feet	Eliminates one-lane/two-way road section. Includes retaining wall.
R-7	B58 area	300 feet	Eliminates one-lane/two-way road section. Includes retaining wall.
R-8	Blackberry Canyon Gate	300 feet	Truck lane for safety and security purposes. Includes retaining wall.

III.D.4.1 Vehicular Circulation

Several circulation improvements are planned to improve vehicular access while minimizing potential pedestrian-vehicular conflicts. Among these are a new service access gate planned off Centennial Drive near Building 73 to provide direct access to the Redwood Cluster area and an additional emergency point of egress. From this new gate, a road upgrade (R-2) is planned that would allow emergency access directly to the Redwood Cluster area. This improved road would connect to Lawrence Road near Building 31 and would provide an important emergency access and egress point from this part of the Lab.

Improvements to the existing Blackberry Canyon Gate (R-8) and Strawberry Gate (R-4) would provide for longer queuing lanes, new guard houses, and improved signage and landscaping. The existing Centennial Drive service access gate at “PG&E Point” would be improved in conjunction with the development of a new service road. (This gate would continue as a service-only access point.) From the improved access gate off Centennial Drive near “PG&E Point,” a new service access road (R-1) would connect to Calvin Road and provide access to the new buildings planned for this area, as well as egress from the new parking lot planned near the gate.

Improvements are planned for the major Lab circulation routes to allow two-way traffic on Chamberlain Road and other service roads (R-7). These improvements include widening in certain areas and the removal of roadside parking. In addition, Chamberlain Road is planned to be rerouted behind Building 71 (R-5) to allow a new building site at the M1 parking lot.

A new north-south roadway is proposed east of the Advanced Light Source (Building 6) (R-6) to more efficiently connect the Lab's two primary east-west roadways. Improvements to the intersection of Glaser and Lawrence Roads (R-3) are proposed to similarly enhance north-south circulation and improve safety.

III.D.4.2 Bicycle Circulation

Bicycle access would continue to be provided on the major and minor roads. Where feasible, bicycle lanes would be provided; in most cases bicycles would share the roadway with cars and trucks, as the moderate speeds dictated by the hill site are suitable to bicycle and vehicle use of the roads.

III.D.4.3 Parking

The proposed project includes development of 1,300 new parking spaces and the removal of 800 existing parking spaces such that parking on the hill site would increase by approximately net new 500 spaces, for a total of 2,800 parking spaces. Table III-5 shows the anticipated net change in parking spaces on the hill site. As is evident from Table III-5, the ratio of adjusted daily population to parking spaces would not increase over the life of the plan. Parking, as guided by the Lab's proposed new Transportation Demand Management (TDM) Program, would comply with UC Policy Guidelines for Traffic (see Mitigation Measure TRANS-1c in Section IV.L, Transportation/Traffic).

TABLE III-5
2006 LRDP PROPOSED PARKING PROGRAM

2003 Baseline Parking Spaces:	2,300
2003 Baseline Adjusted Daily Population (ADP)	4,375
2003 Baseline ADP to Parking Ratio	1.9
Anticipated Additional Spaces:	500
Total Planned Spaces:	**2,800**
Future Adjusted Daily Population (ADP)	5,375
Future ADP to Parking Ratio	1.9
2003 Baseline Parking Spaces:	2,300
Spaces to be removed:	(800)
New spaces to be added in lots:	450
New spaces added in structures:	850
Total spaces per plan:	**2,800**

As described in Section III.A, above, the scope of the proposed 2006 LRDP and the amount of potential development under that LRDP have been reduced since the issuance of the NOP for this EIR. While the NOP anticipated a possible maximum of 600 net new parking spaces, the Lab has determined that the LRDP and the proposed project should be reduced in scope to include 500 net new parking spaces. This reduced scope is due in part to the possibility that DOE funding priorities may limit the scope of development pursuant to the LRDP. More importantly, it is due to concerns raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed under the LRDP. For these reasons, the Lab determined that the proposed project presented in this EIR should include 500 net new parking spaces, rather than 600 net new parking spaces, for a total of 2,800 spaces.

This EIR analyzes two new parking structures with a total of 850 parking spaces proposed to be located near the Lab gates and several mid-sized parking lots would be created, primarily on sites of buildings to be demolished. These lots and structures would consolidate parking spaces removed from roadsides, service areas, the interiors of research clusters, and building sites. Consolidating the parking closer to the gates would be expected to reduce auto circulation within the Lab, creating a more pedestrian-friendly environment, and would also reduce the parking-related impervious surface area at the Lab by concentrating parking in multi-story structures that occupy less ground area per parking space than do surface lots. Preferred sites for two major parking structures and a series of mid-sized parking lots are depicted on Figure III-9, the Illustrative Development Scenario map, p. III-37.

Bicycle parking would be located at building entries and/or at the edges of outdoor open spaces centered in building clusters.

III.D.4.4 Pedestrian Circulation

The 2006 LRDP includes a Pedestrian Circulation Plan that illustrates planned improvements to the pedestrian network at the Lab. The plan also identifies the relationship of the pedestrian network to the shuttle system and to the commons areas. Pedestrian paths would be improved or added in key areas of the hill site, in particular where they would reinforce important connections between and within the research clusters.

III.D.5 Open Space Plan

As depicted on the proposed Land Use Plan, Figure III-3, p. III-7, under the 2006 LRDP, a substantial portion of the Lab main hill site would be designated as Perimeter Open Space. This land use zone would encompass areas set aside due to constraints that require that minimal intrusion or activity occur, and other areas that are intended to remain primarily as open space because they enhance the visual image of the Lab from within and outside the site.

The Lab site also contains large stands of mature trees, grassy slopes, and other vegetation that comprise major additional open space, which occurs within all LRDP land use zones, particularly in the Research and Academic land use zone. These additional vegetated areas are important elements of the character of the Lab site.

III.D.5.1 Perimeter Open Space

Perimeter Open Space would consist of 56 acres, or 28 percent of the 202 acres on the main hill site. These areas around the periphery of the Lab are proposed to be maintained primarily as they currently exist, due to their important biological, aesthetic, or other characteristics.

III.D.5.2 Developed Open Areas

Within the zones where research facilities are currently located, and where future research facilities would be focused, there is a wide variety of open space conditions. Due to the hilly nature of the Lab site, spaces between development clusters, and even between buildings, may function as open space. These spaces are usually rustic in character with trees and a variety of grasses or shrubs. These areas would be maintained in their natural states. In a limited number of cases it may be necessary to re-grade or reshape these areas to facilitate the siting of a future research facility. In such cases, efforts would be made to retain and/or replace trees and other elements that contribute to the open space character of the Lab site.

III.D.5.3 Cluster Open Area

Under the 2006 LRDP, future development at Berkeley Lab would build upon and strengthen the existing hillside cluster development pattern to create a more campus-like setting that reflects its unique site and functional needs. The main hill site would be organized into six “research clusters” defined by major topographic features encompassing research functions that share common needs and interests. One “service cluster” would provide a central location for facilities and shipping/receiving operations. A network of pedestrian paths would link these clusters to the “Central Commons” area that would serve as the social heart of the Laboratory.

Most new buildings would be located on infill sites and/or adjacent to existing facilities, resulting in a higher density of development within each cluster and retention of more undeveloped space between clusters. Outdoor spaces for pedestrian uses would be located toward the center of the clusters, in spaces formally defined by the edges of new and existing buildings. The specific configuration and design of new development within the clusters would be guided by illustrative plans and by the LBNL Design Guidelines that, while separate from the LRDP, would support the Lab’s objectives and address specific design of outdoor spaces and buildings.

At present, the areas most central to the research clusters are typically parking lots, are occupied by temporary facilities (many of which have been in place for many years), or consist of roads or service areas. As proposed under the 2006 LRDP, a large percentage of existing parking and service areas would be relocated, to the extent feasible. This would allow for reconfiguration of the research clusters to function more efficiently and to be connected to one another by pedestrian paths. In addition, improvements to roads would be made to accommodate transit stops, bicycle parking, pedestrian sidewalks, and other amenities to support the Lab’s transportation demand management efforts.

III.D.5.4 Cluster Common Open Area

The intent of the 2006 LRDP is to create a usable outdoor space, such as a plaza, within each cluster. These outdoor spaces would be scaled to be appropriate for the cluster of facilities, with amenities to encourage informal use.

III.D.6 Landscape and Vegetation Management

III.D.6.1 Landscape Framework

While additional research facilities would be added to the Lab in coming years, the hill site is anticipated to retain a strong sense of open space and landscape. The 2006 LRDP includes plans to reinforce this natural appearance, both from outside views as well as from views within the site. The Land Use Plan identifies areas of the campus that would remain undeveloped, and the proposed Landscape Framework further defines the ways in which these various open spaces would be planted and otherwise improved. The 2006 LRDP Landscape Framework identifies five key categories of landscape, each of which would be landscaped or maintained differently. They are depicted in Figure III-8.

Rustic

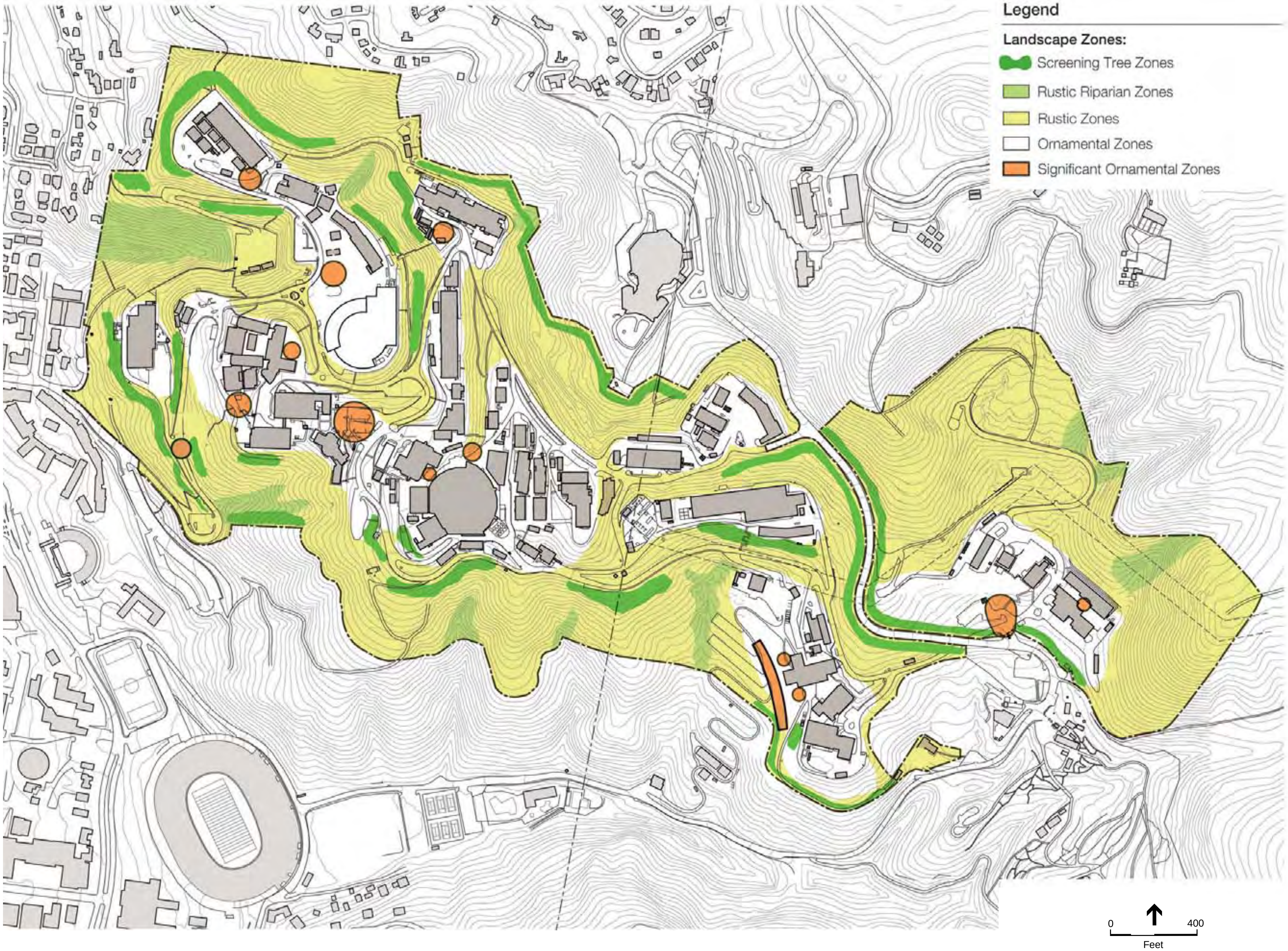
The vast majority of the Lab site is characterized by the rustic, diverse landscape mosaic of oak and mixed hardwood forests, native and non-native grasslands, chaparral, coastal scrub, marsh and wetland communities, and riparian scrubs and forests that would be retained in their naturalistic state. Maintenance activities would be undertaken to maintain the health of these areas. Pedestrian paths would be carefully aligned through these areas, but in general most Lab activities would not occur in these rustic zones.

Rustic Riparian

Several riparian environments that occur on the hill site have significant habitat value. These environments would be protected from development, with only maintenance activities permitted.

Screening

These existing or proposed tree stands would screen views of Lab buildings. Important stands of trees that currently screen Lab buildings from view from the surrounding community would be maintained, and additional screening would be added where it can help maintain the distinctive character of the site. Screening trees would also be added within the main site along Centennial Drive, which passes alongside and, on one overpass, over a portion of the Lab (though fencing restricts Lab access to Centennial Drive users). Screening this area would provide a visual buffer for those passing the Lab site on Centennial Drive on the way to areas higher up in the hills, such as the Lawrence Hall of Science or the University’s Space Sciences area.



SOURCE: LBNL, 2006

Figure III-8
Landscape Framework Plan

Ornamental

The developed areas of the Lab correspond to the research clusters, support areas and parking lots and are currently landscaped with a variety of plant materials. Within the developed portions of the site, where high levels of pedestrian activity occur, ornamental landscapes would be used to add color, visual interest, and other amenities. This strategy would be continued as aging or outdated facilities are removed and new ones are added.

Significant Ornamental

As the common areas within the clusters of research uses are reconfigured to provide more usable outdoor areas, landscaping would be used to reinforce their attractiveness through the use of color, texture, and visual interest. In particular the Central Commons, the primary gathering space of the Lab, would be landscaped and furnished to provide a diversity of usable outdoor environments for special events. At the highest activity pedestrian areas – the Central Commons and secondary commons spaces – special plantings can be used to heighten visual interest.

III.D.6.2 Vegetation Management

As described in the 2006 LRDP, the Laboratory is a campus-like setting maintained in a manner similar to a research park. Continuous improvements in landscaping for both developed and undeveloped areas of the Lab are anticipated under the 2006 LRDP. This landscape management approach is consistent with the Laboratory's fire-safe vegetation management measures that annually remove tree limbs a minimum of six to eight feet from the ground, mow or allow grazing of grasses, remove brush from most vegetated areas of the site, and plant ornamental species near buildings for fire safety. The LRDP landscape management approach is also consistent with urban forestry practices that ensure long-term health of trees and tree stands. Berkeley Lab's existing vegetation management would continue under the 2006 LRDP. Three biologically sensitive areas of the Laboratory have been identified as low fire risk. (Two feature riparian vegetation surrounding perennial or perennial/intermittent drainages, and one is an area of Alameda whipsnake habitat.) These three areas are not managed on an annual basis. However, to preserve the long-term health of trees in these three areas, brush and grasses on the perimeter of these areas are managed under the above annual prescription standards to reduce the risk of ignition of these trees and allow these trees to continue to serve as part of the urban forest. The Lab's vegetation management program would continue to encourage native plants and removal of invasive exotic plants, including French broom, artichoke thistle, Cape ivy, and pampas grass. Eucalyptus and other non-native tree stands across the site would continue to be removed or thinned.

III.D.7 Infrastructure and Utilities

The 2006 LRDP foresees improvements to Berkeley Lab's infrastructure to increase reliability, flexibility, and efficiency, and to increase redundancy in the provision of critical services and utilities. Included among the LRDP's Development Principles is an intention to locate upgraded and new service lines in corridors.

III.D.7.1 Green Building Design, Clean Energy Standards, and Sustainable Transportation Policy

The 2006 LRDP is consistent with the University's Presidential Policy for Green Building Design and Clean Energy Standards, adopted in July 2003 (amended October 24, 2003), which seeks to minimize the University's impact on the environment and to reduce the University's dependence on non-renewable energy. The policy is based on the Leadership in Energy and Environmental Design (LEED) rating system promulgated by the U.S. Green Building Council. Berkeley Lab will design and build all new buildings to meet the LEED "certified" rating, at a minimum, and will strive to meet the higher "silver" rating with additional sustainability features proven to be lifecycle cost-effective. In addition, all new buildings will outperform the required provisions of the California Energy Code by at least 20 percent and the Lab will strive to achieve the goal of procuring at least 20 percent of its electricity needs from renewable resources by 2017. The 2006 LRDP states that Berkeley Lab will develop a sustainability strategy integrating the Lab's site, climate, and infrastructure-intensive facilities to achieve the most sustainable facility practicable.

III.D.7.2 Utility Infrastructure Upgrades

Under the 2006 LRDP, the Lab would continue to upgrade and add utility infrastructure to support building development. These upgrades include projects to improve water, natural gas, electrical, sanitary sewer, storm sewer, and compressed air utility infrastructure. Existing water distribution lines would be replaced over the duration of this LRDP to ensure continued reliability and reduce water demand due to "line-loss" attributed to outdated, deteriorating pipelines. Upgrades to the water system would include replacement of outdated water mains, installation of a new 12-inch EBMUD connection at the Laboratory's northeast boundary to augment the existing two service lines, and replacement of an existing 8-inch line located under Centennial Drive.

During the past approximately 20 years, LBNL has replaced, re-lined, or re-routed approximately half of its sanitary sewer pipes. Under the 2006 LRDP, the Lab would also continue replacing aging sanitary sewer infrastructure to reduce stormwater infiltration during wet weather conditions. Sewer mains on-site would be replaced with new pipe located within the utility corridors where possible. The Strawberry Monitoring Station would be upgraded and the Centennial Drive sewer main from the Life Sciences area would be replaced. Additionally, LBNL would continue working with UC Berkeley and the City of Berkeley to identify a feasible solution to accommodate increased effluent on the Strawberry Outfall due to project-related growth. LBNL has completed a study reviewing four options to divert LBNL-related sanitary sewer flows around problematic sewer lines in Berkeley. Additionally, some two-thirds of the steel pipe that comprises the Laboratory's stormwater drainage system is anticipated to be replaced or fitted with nonmetallic lining.

Implementation of the 2006 LRDP would also require specific connections to the existing electrical and natural gas distribution system. New building and existing equipment replacement projects would enhance the Laboratory's ongoing energy conservation efforts. In addition, new emergency or back-up electrical generators would be installed at several locations, with capacities of up to 750 kilowatts. Finally, improvements are anticipated to be required to the Lab's various specialized utility systems, including compressed air, low-conductivity water, closed-loop cooling water, purified water, and de-ionized water system, as demand for these utilities is expected to increase proportionately with the increase in laboratory space at LBNL under the 2006 LRDP program.

Utility and pipe replacement at LBNL typically includes excavation and trenching, shoring of trenches as necessary, cutting and replacement, and covering and restoring surface areas. Pipe bursting and/or less intrusive pipe lining methods are also used when feasible.

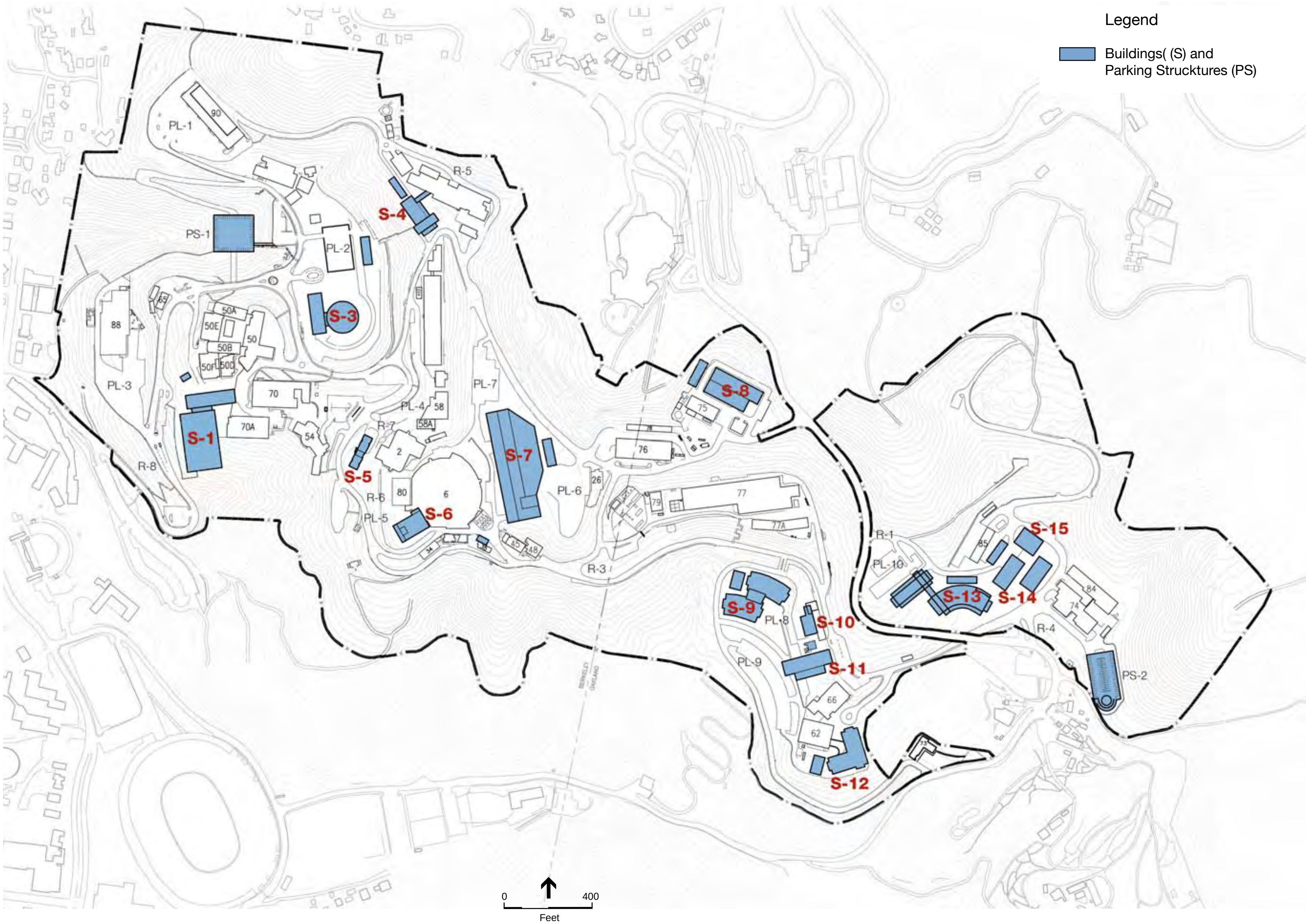
III.E. Conceptual Portrayal of Potential Development: Illustrative Development Scenario

To provide greater detail and more complete public disclosure of potential project impacts, and also to provide a basis for some of the quantified modeling that has been completed for this LRDP, the Lab has developed an Illustrative Development Scenario which is presented in **Figure III-9**.

This Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP that would be consistent with the 2006 LRDP goals and objectives, the 2006 LRDP Land Use Map, the LBNL Design Guidelines, and the LRDP's proposed development uses and square footages. The Illustrative Development Scenario is intended to provide a conservative basis for the analysis of environmental impacts. Actual overall development that is approved and constructed pursuant to the LRDP would be less intense than portrayed in the scenario. The scenario was developed before the proposed 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. At any particular site, however, the level of development may approach the intensity that is portrayed in the scenario, so the scenario remains an appropriate and conservative basis for evaluating the potential environmental impacts of the proposed 2006 LRDP.

Also, the actual locations of buildings, configurations, uses, and the like may vary as specific projects are considered for approval in the future. The Laboratory's needs and opportunities will change over time, at any particular site, and the Illustrative Development Scenario is not intended to be a precise representation of the actual development program that would take place over the 20-year planning horizon of the 2006 LRDP.[19]

[19] It is not possible to forecast accurately the complex series of development opportunities and decisions, including future building locations, sizes, configurations, uses, construction schedules, etc., that would comprise full development of the LRDP program.



SOURCE: LBNL, 2006

Figure III-9
Illustrative Development Scenario

The EIR uses the Illustrative Development Scenario in the following ways:

1) To illustrate potential development pursuant to the 2006 LRDP based upon a conceptual portrayal of such potential development, and therefore give the reviewer an illustrative sense of the scope and scale of potential development at any particular site pursuant to the LRDP.

2) To provide a basis for the EIR's analysis of project impacts consistent with the CEQA Guidelines provisions for program EIRs and consideration and evaluation of future actions after the program EIR has been certified; and

3) To provide a basis for such quantified or modeled studies as the Human health risk assessment and visual simulations.

The Illustrative Development Scenario shows approximate siting and dimensions of new buildings, parking garages, and roadway changes, and demolition of existing buildings. Further detail and discussion of these project elements follow in this chapter. Consistent with the 2006 LRDP Land Use Plan, the Illustrative Development Scenario indicates that development of major new buildings would take place within the Research and Academic, Central Commons, and Support Services zones of the Lab. Parking structures and a number of parking lots would be spread relatively evenly throughout the Lab. Two redevelopment areas are identified, in the Old Town and Bevatron areas. The Illustrative Development Scenario also includes the already constructed Molecular Foundry building.

While actual development at LBNL under the term of the 2006 LRDP would likely not be precisely what is presented in this Illustrative Development Scenario, LBNL would consider how each individual project conforms to the assumptions and impact analyses presented in the 2006 LRDP EIR to determine what, if any, further CEQA documentation is necessary at that time. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Sections 15168(d)(1-3). This use of the Illustrative Development Scenario in connection with further approvals is subject to the overall limitations on subsequent review that have been stated elsewhere in this EIR. In particular, any development in excess of a net total of 980,000 gross square feet of new occupiable (research and support) space construction or 320,000 gross square feet of demolition would require an amendment of the LRDP and accompanying CEQA review. Absent such an amendment and the accompanying additional CEQA review, this EIR (including the Illustrative Development Scenario) will not be used as a first-tier EIR for, or to reduce or streamline the subsequent CEQA processing of, any project that, when added to other construction pursuant to this LRDP, exceeds a net total of 980,000 gross square feet of new research and support space construction or 320,000 gross square feet of demolition.

It is important to understand the difference between the provisions of the proposed 2006 LRDP and the descriptions contained in the Illustrative Development Scenario. If adopted, the provisions of the 2006 LRDP will become binding planning guidelines and policies for the Laboratory, and later projects carried out by the Laboratory must be consistent with the 2006 LRDP (unless the LRDP is amended). In contrast, the descriptions contained in the Illustrative Development Scenario are not binding or governing policies, but the Illustrative Development Scenario will be part of the information that is considered in determining the appropriate form of CEQA review for later approvals of specific projects pursuant to the 2006 LRDP. Thus the scenario is illustrative, and is provided in this EIR for the purpose of evaluating the impacts of development that may occur pursuant to the proposed LRDP. Under the CEQA Guidelines, for later approvals based on a program EIR, the Illustrative Development Scenario may be considered (along with other information, and along with the overall limitations on subsequent review that have been stated elsewhere in this EIR) in determining whether the proposed later approval is within the scope of this EIR's analysis, or whether some level of further analysis is required under CEQA.

III.E.1 Building Construction and Replacement

The 2006 LRDP uses the topography of the overall Laboratory site to define the boundaries of a series of identifiable research clusters, then presents both landscape and building design policies to be applied in order that discernible campus settings are created within each research cluster during the term of this LRDP (see LRDP Section 3, Development Framework).

The research cluster concept would be implemented using the existing development fabric and through a combination of new construction, building renovation, infrastructure improvements, and demolition of outdated buildings. The 2006 LRDP calls for construction of new buildings at a generally greater density and with greater efficiency in design and layout than is the case with many existing LBNL structures, thereby resulting in retention of more undeveloped space between clusters. New and replacement buildings would be constructed using sustainable design practices, including those that minimize energy and water consumption, to meet or exceed the UC Presidential Policy for Green Building Design.

As described previously, occupiable building space on the hill site could increase by up to 660,000 gsf (including the now-constructed 95,000-gross-square-foot Molecular Foundry and the 7,100-gross-square-foot Animal Care Facility). New buildings would provide office, laboratory, and support space for research to accommodate projected growth in ADP and to relieve existing space shortages. New construction would also accommodate special-use spaces, large-scale scientific facilities such as a new accelerator-based light source for ultrafast science (a next-generation Light Source), new microscopes and facilities for the National Center for Electron Microscopy, a new facility to house future generations of supercomputers for the National Energy Research Scientific Computing Center, new specialized nanoscience and biological research facilities for sustainable energy development, and other specialized instrumentation and laboratories for basic research.

The Laboratory would continue to support a development framework that places buildings among trees and generally provides considerable screening of buildings from viewpoints in the city below. There are three building locations that would be more visible from these viewpoints and that have been identified for possible development. These building locations are analyzed as part of the Illustrative Development Scenario and consist of (1) the knoll west of Buildings 70 and

70A and south of the Building 50 complex that is identified in the Illustrative Development Scenario for placement of a high-performance computing facility; (2) the Building 71 knoll (since Building 71 is one of the more visible buildings from below, and further development in this area would also be more visible as tall trees are not generally suitable for the rocky southwest exposure of the slope immediately to the west of this site); and (3) the Building 62 knoll (since Building 62 is one of the more visible buildings from below, and further development in this area would also be more visible as tall trees are not generally suitable for the rocky southwest exposure of the slope immediately to the south and west of this site). Consistent with the LBNL Design Guidelines, the design of buildings to be proposed for any of these sites would incorporate elements that reduce overall visual effects at these locations, such as partial insertion of buildings into hillsides and design of building footprints in parallel with natural terrain.

Berkeley Lab would continue to ensure that all new buildings, structures, program equipment, and heavy shielding are designed to resist a magnitude 7+ earthquake on the Hayward Fault without collapse or a magnitude 8.3 earthquake on the San Andreas Fault without collapse.

III.E.2 Potential New Buildings

Under the term of the 2006 LRDP, a number of new buildings, along with support, utility, and parking structures, may be constructed. For reasons previously discussed, including uncertainty in future funding processes and scientific initiatives, it is not possible to project with confidence which specific buildings will be built or what final forms or locations will be considered or approved. Nevertheless, this EIR includes in the Illustrative Development Scenario and analyzes a series of buildings that could be constructed pursuant to the 2006 LRDP. As already explained, the sum total of potential development that is included in the Illustrative Development Scenario is greater than would be allowed under the 2006 LRDP, because the Illustrative Development Scenario was developed before the proposed 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. At any particular site, however, the level of development may approach the intensity that is portrayed in the scenario, so the scenario remains an appropriate and conservative basis for evaluating the potential environmental impacts of the proposed 2006 LRDP.

The major new buildings, parking structures, and roads included in the scenario are identified on the scenario map (Figure III-9) and are described in Tables III-6 and III-7. Although it is expected that many aspects of those buildings and their descriptions may change in the future, and although the scenario presents an overall assessment of development greater than would be allowed under the 2006 LRDP, they represent what LBNL expects to be a representative depiction of potential future projects and their associated environmental impacts under the 2006 LRDP. Except for specific projects identified in this chapter as already undergoing CEQA review (such as the Guest House and the User Support Building), the timing, geographic locations, and/or specific building uses, sizes, and designs have not been determined and would be dependent upon research and support needs and the availability of funding, as well as the changing dynamics involved with obtaining such funding.

TABLE III-6
ILLUSTRATIVE DEVELOPMENT SCENARIO: POTENTIAL NEW BUILDINGS

			Area (gsf)			Massing	
Bldg. No.	**Description**	**No. of Occupants**	**Main Bldg.**	**Support Bldg.**	**Total Project**	**Floors**	**Footprint (sf)**
S-1	Office/Computer Research	440	165,000	10,000	175,000	6	65,000
S-2	Not Used	—	—	—	—	—	—
S-3	Lab/Office	435	200,000	15,000	215,000	8	45,000
S-4	Lab/Office	110	50,000	4,000	54,000	4	17,000
S-5	Guest House	70	25,000	0	25,000	3	10,000
S-6	Lab/Office	60	30,000	3,000	33,000	3	13,000
S-7	Accelerator Facility	200	130,000	12,000	142,000	2	106,000
S-8	Shops / Office	65	30,000	4,000	34,000	3	17,000
S-9	Lab/Office	220	100,000	8,000	108,000	3	40,000
S-10	Lab/Office	12	6,000	0	6,000	2	4,000
S-11	Lab/Office	140	89,000	7,000	96,000	6	22,000
S-12	Lab/Office	260	120,000	9,000	129,000	4	32,000
S-13	Lab/Office	220	100,000	8,000	108,000	4	40,000
S-14	Lab/Office	220	100,000	8,000	108,000	6	27,000
S-15	Animal Care Facility	10	7,000	0	7,000	1	7,000
Total			**1,152,000**	**88,000**	**1,240,000**		**445,000**

gsf – gross square feet; sf – square feet

TABLE III-7
POTENTIAL NEW PARKING STRUCTURES / LOTS

No.	**Location**	**Spaces**	**Area (sf)**	**Decks**	**Height (feet)**	**Footprint (sf)**
	Structures					
PS-1	Blackberry Canyon	780	260,000	7	70	37,200
PS-2	Life Sciences Area	340	112,000	5	38	22,300
	Sub-Total	1,120	372,000			59,500
	Surface Lots		Lot Area			
PL-1	Building 90	40	14,000			
PL-2	51 Area	90	31,500			
PL-3	Building 88	25	8,750			
PL-4	Building 58	30	10,500			
PL-5	Building 10	25	8,800			
PL-6	Building 26	90	31,500			
PL-7	ALS Area	75	26,250			
PL-8	Building 72	15	6,000			
PL-9	Redwood Cluster	100	35,000			
PL-10	Strawberry Cluster	120	42,000			
	Sub-Total	610	214,300			
	Total[1]	**1,730**				

sf – square feet

1 New parking spaces would be constructed while existing parking spaces would be removed so that the total net new parking spaces at the LBNL main site would never exceed 600 spaces.

TABLE III-8
CONSTRUCTION ACTIVITY LEVELS

	Anticipated Large Construction Project (24 months total)	Anticipated Sitewide Average Annual Construction Activity Level	Anticipated Peak Construction Annual Average
Construction	100,000 gsf	80,000 gsf	160,000 gsf
Excavation/Grading	7,000 cu. yds.	5,500 cu. yds.	11,000 cu. yds.
Excess Soil for Off-Site Disposal/ Truckloads[1]	600 truckloads	500 truckloads	1,000 truckloads
Foundation	300 truckloads	250 truckloads	500 truckloads
Construction	1,000 truckloads	800 truckloads	1,600 truckloads
Total Truckloads	**1,900 truckloads**	**1,550 truckloads**	**3,100 truckloads**

gsf – gross square feet; cu. yds. – cubic yards

1 Projects at LBNL often involve cut-fill excavation. The most conservative assumption for analysis, employed here, holds that all excavated soils are transported off-site for disposal. Soil would be hauled in volumes of approximately 12 cubic yards per truck.

The Illustrative Development Scenario includes two projects that have been approved and constructed pursuant to the 1987 LRDP EIR, as amended: the Molecular Foundry (S-11) and the Animal Care Facility (S-15). The scenario also includes several projects that are either currently under consideration and undergoing CEQA review or anticipated to undergo CEQA review in the near future, or likely to be under consideration at some point in the future. These projects are the CRT Building (S-1), the Helios Research Facility (S-12), the Guest House (S-5), the User Support Building (S-6), and the Bevatron demolition project. More details regarding all of these projects are included in this chapter in the discussion entitled “Changes in Baseline Conditions Since 2003” and in Appendix A.

III.E.3 Construction and Demolition

III.E.3.1 Construction

The Illustrative Development Scenario includes ongoing demolition and construction activities over the course of the 20-year planning period. (Such activities are already a common part of Berkeley Lab’s operative routine, as the Lab has been undergoing constant growth, change, or renewal of its physical plant since its inception.) Construction planning for large projects includes consideration of environmental and regulatory elements of each project. (Environmental, health, and safety considerations relevant to construction and demolition operations are discussed in Section IV.F, Hazards and Hazardous Materials, of this EIR.) Construction activities usually include the need for adjacent lay-down areas for equipment, supplies, and fabrication activities, as well as construction-worker parking, typically on or near a job site. Under the 2006 LRDP, construction activities would be similar to current practices. It is expected that, as at present, large construction projects would not often occur simultaneously, although such projects may have some degree of overlap in schedules.

Construction at LBNL typically begins with demolition of existing facilities at a site, if necessary. Site clearing and excavation work follows. If excavation is involved, soil may be shipped off- or on-site during this phase unless the project is a balanced cut-fill excavation. Foundation work, building frame erection, and building finishing are the three major phases to follow. Under optimal conditions, site work for large projects at Berkeley Lab typically is scheduled to occur between the months of April through September for optimal weather conditions, although it may occur in any month of the year, and the remaining phases may also take place at any time during any season.

As with current practices, construction equipment would typically include large vehicles, stationary equipment, and hand-held equipment used on the building site and at nearby staging areas, and would be powered by diesel or gasoline engines or electricity. Such equipment would include scraper/dozers, spreader/compactors, loaders, drill rigs, haul trucks, cement trucks, bore drillers, rough terrain forklifts, pavers, rollers, and other rigs. All equipment would comply with applicable regulatory standards, including required noise, emissions, safety, and energy efficiency standards.

For the purposes of this EIR, the term “construction,” unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities. The maximum total new construction and renovation under the Illustrative Development Scenario is 1.6 million square feet. This includes 1,240,000 gsf of new occupiable building space construction along with 372,000 gsf of new parking structures. While parking structures are not considered part of the occupiable space totals identified in the 2006 LRDP, they do account for potential construction-related impacts and are thus considered in this EIR analysis. When the projected demolition figure of 440,000 gsf is subtracted from the new occupiable building space total, the net projection for new space – 800,000 net new gsf – is derived. Table III-8 identifies the construction activity level for a typical large construction project, divided into the major phases of construction. A project roughly the size of the Molecular Foundry (approximately 95,000 gsf, plus substantial grading) is used to represent a project of this scale. Because the typical large project at the Lab is projected to take approximately two years to construct, it should be noted that the values in this column in Table III-8 are spread over 24 months and would need to be divided by two in order to translate them into annual figures.

Table III-8 also compares anticipated average and peak annual levels of construction activity, by major phases of construction. For the main site, the annual averages are approximately equivalent to one large construction project being underway at all times at Berkeley Lab and are derived by combining total construction elements of the major projects identified in the Illustrative Development Scenario (e.g., total square footage, footprint square footages, etc.), and then dividing these aggregates evenly over the 20-year planning period. The Lab’s more recent historical construction patterns hold that there are extended periods of little or no major construction interspersed with periods when more than one medium or large construction project may be simultaneously underway. Consequently, an annual peak average is analyzed in this EIR, which is equivalent to the average annual construction level augmented by an additional large-scale construction project. In this way, the peak annual average construction activity level is approximately twice the annual average, or the equivalent of two large construction projects being underway simultaneously. There is no foreseeable year or period of years between 2006 and 2025 when this peak annual average construction activity level is anticipated to occur, if ever. Rather, this level represents the maximum anticipated construction activity level for analytical purposes.

The calculation of excavation-related truck trips assumes the use of 12-cubic-yard haul trucks. Excavation for these projects is assumed to be one-third of a cubic yard of excavated material for each square foot of project footprint, or about nine feet of excavation under the footprint of each building or parking structure identified in the Illustrative Development Scenario. While this ratio is likely to be exceeded with some projects, others would require less excavation or would be balanced cut-fill excavations. Foundations and excavation areas are assumed to be approximately the size of the building footprints identified in the Illustrative Development Scenario. Foundations are assumed to be approximately up to five feet in depth and would be hauled in trucks, each assumed to hold foundation materials of approximately 12 cubic yards. Based on recent experience, a large building project is estimated to require approximately 1,000 truckloads of materials, including steel structural, siding, and interior finishing materials.

The Illustrative Development Scenario and construction estimates are conservative for the purposes of this analysis, meaning that the actual amount of construction would be less than portrayed in the Illustrative Development Scenario. This conservative approach has been taken to ensure that this EIR does not underestimate project impacts. For example, construction levels analyzed in this EIR represent approximately 2.7 times historic levels of construction at Berkeley Lab.

III.E.3.2 Demolition

In addition to construction of new building space, the Illustrative Development Scenario considers for purposes of analysis the possible demolition of up to 440,000 gsf of outdated facilities on the hill site. Demolition is considered for buildings and structures that are seismically poor and not cost-effective to upgrade, no longer suitable for modern science, costly to maintain, and make inefficient use of valuable building sites within the existing developed zone of Berkeley Lab. As of 2004, more than 60 percent of LBNL buildings were more than 40 years old, and 5 percent were over 60 years old, beyond the effective age of a typical laboratory building. Additionally, many of these buildings were constructed as temporary structures but were never removed or replaced. A substantial portion of these buildings is concentrated in two areas: the Bevatron area, where the Laboratory currently seeks funding and approval from DOE to demolish the former accelerator facility at Building 51; and near the Advanced Light Source, in the area of the Lab known as "Old Town." The Bevatron, in Building 51, was among the world's leading particle accelerators during its operation from 1954 until 1993, and contributed significantly to particle and nuclear physics.[20] The Old Town area surrounding the Advanced Light Source

[20] Building 51 is an approximately 126,500-gross-square-foot structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop, and office functions. Under the demolition project, the concrete shielding blocks that surround the Bevatron would be removed, the Bevatron apparatus would be disassembled, Building 51 and the shallow foundation underneath the building would be demolished, and the resulting debris and other materials would be removed. The site would then be backfilled, and the fill compacted and leveled. Berkeley Lab completed a Draft EIR for the demolition of Building 51 complex in November 2005, tiered from the 1987 LRDP EIR, as amended. Certification of the Bevatron EIR and approval of the demolition project are anticipated to be considered in early 2007. For purposes of this EIR, the Building 51 complex is considered part of the existing setting, and the Bevatron demolition project is incorporated into this EIR as the "anticipated large demolition project" for analytical purposes.

(Building 6) includes many early Lab buildings that are currently outdated and underused. This area contains World War II-era buildings that are not suitable for modern science and are no longer fully functional. The average age of these small-scale wooden scientific buildings is 55 years; their removal would create a large 5.5-acre site available for modern research structures.

In general, the 2006 LRDP foresees demolition of buildings that "can no longer reasonably meet modern mission needs and should be removed to make way for new modern structures." Redevelopment of such buildings would allow not only for physical upgrade of the Lab, but would also provide opportunities for increased building efficiency, improvements to site circulation and utility systems, and implementation of sustainable design practices. In many cases, the Laboratory would demolish surplus or outdated facilities prior to the identification of particular replacement buildings. The Laboratory would upgrade utilities and roadways in order to create "plug-in" development sites within the central core of the Laboratory.

Active demolition project phases at LBNL generally proceed as follows: (1) contents of the building are characterized; (2) hazards, if any are present, are abated, including asbestos-containing materials and lead-based paint; (3) reusable and recyclable materials are identified and removed; (4) the structure is demolished and removed; (5) foundation and utilities may be removed; and (6) any holes are filled, the site is graded as necessary, and the site is landscaped or reused.

Demolition equipment would include large vehicles, stationary equipment, and hand-held equipment similar to that involved in construction.

Table III-9 identifies the major phases of demolition of a project roughly the size of the Building 51 demolition in order to conservatively represent a large-scale demolition project. The table compares anticipated average and peak annual average levels of demolition activity, broken out into principal demolition parameters for analysis. As with construction, the annual average is derived by dividing the total by the 20-year planning period. The calculation of truck trips assumes 10-ton haul trucks.

TABLE III-9
DEMOLITION ACTIVITY LEVELS

	Anticipated Large Demolition Project 12-Month Peak Activity Level	Anticipated Average Annual Demolition Activity Level	Anticipated Peak Annual Demolition Activity Level
Gross Square Feet	32,000 gsf	22,000 gsf	54,000 gsf
Weight (125 lbs/sf)	2,000 tons	1,375 tons	3,375 tons
Truck Trips Subtotal	200 truckloads	140 truckloads	340 truckloads
Shielding Blocks	400 truckloads	50 truckloads	450 truckloads
Total Truckloads	600 truckloads	190 truckloads	790 truckloads

gsf – gross square feet; sf – square feet; lbs – pounds

Similar to construction activity, in the Lab's more recent historical demolition patterns, there have been extended periods of little or no major demolition interspersed with periods where more than one medium or large demolition project is underway. Consequently, a peak annual average is analyzed in this EIR, which is roughly equivalent to the average annual demolition level augmented by the addition of a large-scale demolition project during its peak 12-month phase. The peak annual average demolition activity level is greater than four times the calculated annual average. Because there are no other demolition projects identified that would approach the scale of the Bevatron, it is anticipated that the peak demolition level would only be achievable in a year during which Bevatron demolition is taking place.

Building demolition proposed under the Illustrative Development Scenario is identified in Table III-10.

TABLE III-10
ILLUSTRATIVE DEMOLITION PROGRAM

Bldg.	Area[1]	Ref.[2]	Bldg.	Area[1]	Ref.[2]	Bldg.	Area[1]	Ref.[2]	Bldg.	Area[1]	Ref.[2]
70A	3,000	*S1*	**71J**	1,280	*S4*	**44**	805	*S7*	**67B**	1,238	*Tmp*
70E	432	*S1*	**71K**	470	*S4*	**44A**	481	*S7*	**67C**	1,237	*Tmp*
51B	44,000	*S3*	**71P**	500	*S4*	**44B**	1,441	*S7*	**76K**	425	*Tmp*
51	96,566	*S3*	**71Q**	350	*S4*	**52**	6,425	*S7*	**76L**	1,439	*Tmp*
51A	28,462	*S3*	**29A**	1,751	*S5*	**52A**	516	*S7*	**90J**	2,846	*Tmp*
51F	1,499	*S3*	**29B**	1,440	*S5*	**75A**	4,000	*S8*	**90K**	2,844	*Tmp*
64	28,179	*S3*	**29C**	1,440	*S5*	**69**	20,400	*S8*	**75B**	4,640	*Tmp*
64B	480	*S3*	**29D**	276	*S5*	**31**	7,300	*S9*	**75C**	450	*Tmp*
90B	1,443	*S3*	**10**	15,000	*S6*	**31A**	600	*S9*	**75D**	1,895	*Tmp*
90C	1,193	*S3*	**4**	10,176	*S7*	**31B**	150	*S9*	**75E**	410	*Tmp*
90F	2,462	*S3*	**5**	7,176	*S7*	**31C**	150	*S9*	**50C**	2,766	*Exc*
90G	1,853	*S3*	**7**	21,433	*S7*	**62***	10,000	*S12*	**50D**	4,959	*Exc*
90H	1,921	*S3*	**7A**	128	*S7*	**62A**	1,238	*S12*	**61**	323	*Exc*
90P	2,129	*S3*	**7C**	479	*S7*	**73A**	403	*S12*	**70G**	173	*Exc*
90Q	425	*S3*	**14**	4,201	*S7*	**83**	6,995	*S14*	**74F**	1,560	*PS-1*
90R	160	*S3*	**16**	11,808	*S7*	**83A**	538	*S14*	**17**	2,222	*S7*
71A	4,000	*S4*	**16A**	339	*S7*	**85B**	3,603	*S14*	**27**	3,299	*S7*
71C	500	*S4*	**25**	20,306	*S7*	**46B**	1,239	*Tmp*	**53**	6,944	*S7*
71D	500	*S4*	**25A**	7,548	*S7*	**46C**	1,029	*Tmp*	**53B**	519	*S7*
71E	500	*S4*	**25B**	360	*S7*	**46D**	775	*Tmp*			
71F	500	*S4*	**40**	993	*S7*	**65B**	1,020	*Tmp*	***Total Demolition***		
71G	500	*S4*	**41**	995	*S7*	**65A**	1,454	*Tmp*	***439,904 gsf***[3]		

1 In gross square feet (gsf)

2 Ref. (Reference):
S1 – S14 and PS-1 – PS-3 are Illustrative Development Scenario buildings that might require the existing building demolition indicated on the above table.
"Tmp" indicates temporary buildings, such as trailers.
"Exc" indicates excess buildings.
* indicates a building that would be partially demolished.

3 As previously noted, overall demolition pursuant to the 2006 LRDP is limited to 320,000 gross square feet of existing space. Thus, all of the demolition listed in this table cannot be carried pursuant to the 2006 LRDP, although a variety of combinations of potential demolition projects could be carried out, and any single demolition project set forth in this table could be implemented based on the 2006 LRDP.

III.E.3.3 Renovation

When a built space becomes outdated, obsolete, or otherwise unable to serve its intended mission, that space becomes a candidate for demolition or for adaptive reuse to serve another mission or need. The latter process is considered "renovation." Up to 600,000 gsf of current LBNL built space that is not planned for demolition in the 2006 LRDP will be obsolete or more than 50 years old by the year 2025 and will be in need of renovation during the planning period. This analysis assumes that renovation would take place at an average of 30,000 gsf per year, with up to 60,000 gsf being renovated during a peak year. Renovation projections are included in addition to construction figures for this analysis.

Renovation includes installation, replacement, or upgrading of HVAC (heating, ventilation, and air conditioning) systems, electrical systems up to 480 volts, elevators, windows, flooring, roofs, interior building fixtures, and insulation. It includes repairs and repainting of building interiors and exteriors. It is also necessary for upgrading buildings to meet seismic and Americans with Disabilities Act (ADA) regulations. Renovation involves general low-level construction and maintenance activities and often includes small or hand-held tools, shop tools, material handling equipment, and occasionally cranes and trucks.

III.E.3.4 Combined Construction and Demolition Activities

Cumulative impacts of construction and demolition are analyzed in this EIR by considering the impacts of aggregate average and peak annual construction and demolition activities, along with in- and out-bound trucks associated with those activities (see Table III-11).

TABLE III-11
CONSTRUCTION AND DEMOLITION ACTIVITIES

	Average Annual Demolition	Average Annual Construction	Average Annual Renovations	Total Average Annual[1]
Square Feet	22,000	80,000	30,000	132,000
Truckloads	190	1,550	300	2,000
	Peak Annual Demolition	**Peak Annual Construction**	**Peak Annual Renovations**	**Total Peak Annual[1]**
Square Feet	54,000	160,000	60,000	274,000
Truckloads	790	3,100	600	5,000

1 Numbers rounded.

III.E.3.5 Facilities Maintenance

In addition to the construction and replacement activities described above and elsewhere throughout this document, Berkeley Lab would continue to carry out routine maintenance, repairs, and improvements to its buildings, equipment, and grounds as part of normal facility management through 2025. Under the proposed 2006 LRDP, these activities would be expected to incrementally increase as Lab population and space increases. Facilities maintenance and other operations and logistical spaces would provide for operating, maintaining, and repairing the Lab's buildings and grounds. Such spaces include wood, metal, machine, and paint shops; materials delivery and storage areas; construction staging and laydown areas; vehicle and equipment depots; utility banks and buildings; waste handling facilities; and cleaning facilities.

III.F. Required Project Approvals and Intended Uses of This EIR

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land owned or controlled by the University. The Board of Regents is the University's decision-making body and is responsible for approving the 2006 LRDP and the physical facilities to be constructed on University-owned land. The Regents will review and consider this EIR in conjunction with review and consideration of the 2006 LRDP. It is anticipated that these documents would be presented for The Regents' consideration and approval at one of the 2007 Regents meetings after the Lab has prepared a Final EIR including responses to all of the comments that have been submitted. In addition, the Berkeley Lab Design Guidelines, which are referenced in this EIR and included in Appendix B, are proposed to be adopted by the Lab as a companion document to the 2006 LRDP.

This EIR is intended to be used for the following actions, and will serve the following purposes:

1) The EIR provides The Regents with information upon which to evaluate the environmental implications of the LBNL 2006 LRDP, including environmental impacts and mitigation measures that could avoid some of those impacts, and the EIR will be used as the CEQA document for The Regents' consideration of the 2006 LRDP, and the adoption of required findings and other actions by The Regents in connection with their consideration and possible adoption of the 2006 LRDP.

2) The EIR will also be utilized in connection with the consideration by the Lab and/or by The Regents of specific projects pursuant to the 2006 LRDP, and possibly for the later modification of such projects. Pursuant to CEQA Guidelines Section 15168 and as described in Chapter I (Introduction), some projects may be approved as within the scope of this EIR and other projects will be approved after a second-tier CEQA document is prepared. Any use of this EIR in connection with subsequent approval is subject to two additional restrictions, also described in Chapter I, that resulted from consultations with the City of Berkeley. This EIR will not be used as the first-tier EIR for (or otherwise to streamline review of) any project exceeding a net total of 980,000 gross square feet of new occupiable (research and support) space construction or 320,000 gross square feet of demolition, and a new traffic study will be prepared on the earliest to occur of ten years after this EIR is certified or the date on which development at the Lab pursuant to the 2006 LRDP reaches 375 net new parking spaces.

3) Consistent with the use of this EIR for specific projects pursuant to CEQA *Guidelines* Section 15168, this EIR will also provide information to responsible agencies with permitting or approval authority over projects that may be implemented under the 2006 LRDP, including the potential approvals listed under "permitting and approvals" below; and

4) This EIR is also intended to be used by the University, consistent with the provisions of CEQA, in connection with other specific actions that may be necessary or desirable to approve and implement the 2006 LRDP.

III.F.1 NEPA

The National Environmental Policy Act of 1969 (NEPA; 42 USC 4321–4347) requires federal agencies to consider the environmental effects of, and alternatives to, proposals for major federal actions that would significantly affect the quality of the human environment. In connection with a subsequent development project proposed to be carried out under the 2006 LRDP (e.g., construction of a particular research laboratory or other similar building), if also subject to an authorization or decision of DOE or another federal agency, that project will undergo a review by the relevant federal agency to determine the appropriate level of NEPA documentation, based on the project's reasonably foreseeable environmental impacts. Typically, projects carried out under the 2006 LRDP will receive NEPA as well as CEQA review. NEPA review is not required in those few cases where a federal agency authorization to undertake the action is not involved (for example, where construction takes place on a non-DOE leased parcel at LBNL and without federal funding).

The 2006 LRDP is a University-mandated planning document. Although the Lab is operated by the University for DOE, DOE does not require this state-mandated document. Thus, the 2006 LRDP does not constitute a "federal action" subject to NEPA review.

III.F.2 Permitting and Approvals

The only agency approval – federal, state, or local – required for adoption of the 2006 LRDP and of this program-level EIR is that of The Regents of the University of California. Shortly following The Regents' action, it is anticipated that the Lab will adopt the proposed Berkeley Lab Design Guidelines as a companion document to the LRDP. Action by other agencies is not required to adopt the 2006 LRDP or the Berkeley Lab Design Guidelines. Nevertheless, under limited circumstances and as individual development projects move forward, other permits and approvals may be required or voluntarily sought by LBNL. These include the following:

Section 404 Permit: Although not anticipated at this time, implementation of the 2006 LRDP could result in the filling of wetlands and other waters of the United States. The U.S. Army Corps of Engineers regulates the nation's waterways and wetlands, and is responsible for implementing and enforcing Section 404 of the federal Clean Water Act. Corps of Engineers regulations require that any activity that discharges fill material or requires excavation in "waters of the United States," including wetlands, must obtain a Section 404 permit.

Section 401 Water Quality Certification: The State Water Resources Control Board and the Regional Water Quality Control Boards (RWQCBs) promulgate and enforce narrative and numeric water quality standards in order to protect water quality and adopt and approve Water Quality Control Plans. The State Board and the RWQCBs also regulate discharges of harmful substances to surface waters, including wetlands, under the federal Clean Water Act and the

California Porter-Cologne Water Quality Control Act. If issuance of a Section 404 permit is required, it will be subject to water quality certification under Clean Water Act Section 401.

Section 7 Consultation: The Federal Endangered Species Act requires a federal agency (potentially the Army Corps of Engineers if issuance of a Section 404 permit is required) to seek formal consultation with the U.S. Fish and Wildlife Service (USFWS) for any action that may result in the "take" of a species listed as threatened or endangered, or proposed for listing as threatened or endangered. Based on this consultation, the USFWS issues a biological opinion determining whether the project is likely to adversely affect or jeopardize the continued existence of a federally listed species, or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. Section 7 consultation may also be required for any project that receives federal funding.

Section 10 of the Endangered Species Act: Section 10 of the Federal Endangered Species Act provides a nonfederal applicant a mechanism to obtain incidental take authorization for federally listed threatened or endangered species.

Section 106 Compliance: For projects with federal funding, the National Historic Preservation Act of 1966 (NHPA), as amended by 16 United States Code section 470 et seq., Section 106, 36 Code of Federal Regulations (CFR) 800, includes provisions for protection of significant archaeological and historical resources. Procedures for dealing with previously unsuspected cultural resources discovered during construction are identified in 36 CFR 800 (for implementing Section 106 processes). The administering agency is the State Historic Preservation Officer (SHPO) and the federal lead agency.

Section 1601 Permit: The California Department of Fish and Game (CDFG) requires notification for any project or activity that will take place in, or in the vicinity of, a river, stream, lake, or its tributaries. Section 1601 (1603 for private entities) of the Fish and Game Code requires that state or local governmental agencies notify the CDFG before they begin any construction project that will (1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; (2) use materials from a streambed; or (3) result in the disposal or disposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake.

Section 2081 Compliance: Section 2081 of the California Endangered Species Act permits the "take" (hunt, pursue, catch, or kill) of endangered or threatened species, provided that the take is incidental to an otherwise lawful activity, the impacts of the authorized take are minimized and fully mitigated, the take permit is consistent with the CDFG recovery programs, the applicant ensures adequate funding to implement the mitigation and monitoring program, and the action will not jeopardize the continued existence of the species. Substantial information regarding state-listed species is presented in Section IV.C, Biological Resources, of this EIR.

NPDES Permits: The Clean Water Act requires a National Pollutant Discharge Elimination System (NPDES) permit for any discharge of pollutants from a point source to waters of the United States. This law and its regulations also apply to stormwater in certain circumstances. In

1987, Congress amended the Clean Water Act to require implementation, in two phases, of a comprehensive national program for addressing stormwater discharges. Phase 1 requires NPDES permits for stormwater discharge from a large number of priority sources, including medium and large municipal separate storm sewer systems, and several categories of industrial activity, including construction activity that disturbs five or more acres of land. Phase II of the stormwater program requires permits for stormwater discharges from certain small municipal separate storm sewer systems and construction activity generally disturbing between one and five acres. The Lab is subject to Phase II regulations.

Other Permits and Approvals: A variety of other permits and approvals from federal, state, and local agencies may be needed for future projects, or for implementation of project mitigation. These may include encroachment permits and approvals from infrastructure providers for service and extension of facilities to the Berkeley Lab or its new programs and projects.

CHAPTER IV

Environmental Setting, Impacts, and Mitigation Measures

IV.A. Aesthetics and Visual Quality

IV.A.1 Introduction

This section identifies existing visual resources at the LBNL hill site and analyzes the potential for implementation of the 2006 LRDP to affect those resources. Information presented in the discussion and subsequent analysis was drawn from site visits, LBNL's 1987 LRDP and associated environmental impact reports, surveys and environmental documents associated with specific LBNL projects, and the Illustrative Development Scenario prepared by LBNL to illustrate a single iteration (of many possible iterations) of future Lab development under the 2006 LRDP. The physical characteristics of the site and surrounding areas are discussed briefly. For a more detailed description of the land uses mentioned below, refer to Section IV.H, Land Use and Planning.

Eight computer-generated visual simulations illustrating "before" (current) and illustrative "after" visual conditions from representative public vantage points near the LBNL site are presented as part of this analysis. The locations of the visual simulation vantage points were selected in consultation with visual resources professionals and LBNL staff and were chosen to represent viewpoints that are both highly accessible to the public and that provide the most direct views of potential site changes as illustrated in the Illustrative Development Scenario. These viewpoints are indexed to a Viewpoint Location Map (see Figure IV.A-1) included in this section.

IV.A.2 Setting

Portions of LBNL adjoin urban neighborhoods, and various areas within the site are visible from a number of the surrounding uses. However, as discussed below, due to the presence of on-site and off-site landforms, structures, and vegetation, and due to the site's relative elevation, the project site is partially screened from a variety of public vantage points. While many views of portions of the project site and of individual buildings or groups of buildings are available from such vantage points as Memorial Stadium, the Lawrence Hall of Science, Grizzly Peak Road, and downtown Berkeley, the site as a whole cannot be viewed from a single on-the-ground vantage point.

Viewpoint Key

1. Lawrence Hall of Science north parking area, Berkeley
2. Lawrence Hall of Science outdoor exhibition area, Berkeley
3. Crosswalk at UC Botanical Garden, Berkeley
4. Panoramic Way, Berkeley
5. Shattuck Avenue at Center Street, Berkeley
6. Hearst Avenue at Shattuck Avenue, Berkeley
7. University Avenue at San Pablo Avenue, Berkeley
8. Ridge Road at Euclid Avenue, Berkeley

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure IV.A-1
Viewpoint Location Map

IV.A.2.1 Visual Quality

The assessment of existing visual quality is organized according to the following general descriptive categories: site location and landform, land use and building design, and vegetation.

Site Location and Landform

The project site is located on the steeply sloping hillsides of the Oakland-Berkeley hills. Site topography rises from an elevation of approximately 500 feet near the main visitor entrance at the Blackberry Canyon Gate to approximately 1,100 feet near Building 71 at the northern border of the hill site.

Because of its varied topography and upland location, the LBNL site was constructed as a series of buildings clustered together on interlinked terraces, separated by rustic landscaped areas. Permanent buildings are generally located adjacent to surface parking lots; temporary one-story trailers are often located between the site's permanent buildings and on-site roadways. The steep topography of the LBNL site influences its visual character by separating structures vertically, and it reinforces the clustered pattern of development. Buildings located quite close together in plan (overhead) view are seen as discrete elements in the landscape in mid- and long-range views of the site.

Land Use and Building Design

The LBNL hill site is occupied by approximately 110 conventionally constructed buildings, along with approximately 90 on-site trailers, utility buildings, and other miscellaneous structures. The greatest density of both on-site development and activity is concentrated in two adjoining clusters: the Building 50 complex and the area surrounding the Advanced Light Source (Building 6). With the exception of the eight-story Building 50 complex, the majority of the Laboratory's buildings range in height from one to four stories, with taller buildings stepped into the hillside, reducing apparent building height. Other areas on the hilltop site, such as the Life Sciences Cluster in the eastern portion of LBNL near the Strawberry Canyon Gate on Centennial Drive, are less densely developed.

The visual character of LBNL's built environment is eclectic. Many buildings display an industrial look and utilitarian quality due to the type of building materials (e.g., poured-in-place concrete, corrugated metal siding, etc.) and the visible mechanical equipment (exposed pipes, vents, panels, and tanks) related to the activities occurring in the buildings. Many LBNL buildings are painted in neutral colors (grey, beige) to blend with the natural setting. Some of the site's newer buildings depict somewhat livelier hues (light green, powder blue), such as Building 84 in the Life Sciences Cluster near the eastern edge of the hill site. A few LBNL buildings are recognizable landmarks, including Building 50 and the Advanced Light Source, both of which are visible from off-site locations. (The Bevatron is also recognizable from some higher-elevation viewpoints. See discussion of views, below.) However, eucalyptus and pine trees along with oak and bay laurel are interspersed throughout the site and adjoining areas; these trees contribute to screening of many views to the site from the UC Berkeley campus and from adjacent streets and neighborhoods. Nevertheless, current views of the Laboratory from nearby areas are not of pristine natural settings, even where trees predominate. Instead, human intrusion is widespread, with evidence of built forms—buildings; roadways, sidewalks, and hillside stairways; bus shelters; fencing; signage; and streetlights and other utilities—nearly omnipresent.

Much of the built environment on the hilltop site lacks a strong overall sense of visual hierarchy. Structures were often built on an "as-needed" basis and are generally not related in ways that support interaction or optimal use of the developed areas. Permanent buildings are typically connected directly to parking areas, and many contain little (or no) open space to buffer pedestrian entrances from adjacent surface parking or other temporary structures. With the exception of painted numbers on the sides of most of the buildings, the majority of LBNL buildings are not identified with highly noticeable signage to indicate the building's name or function, as might be typically found with commercial or publicly accessible institutional buildings. Temporary buildings and trailers are often indistinguishable from each other and provide limited visual interest. Many of the site's pathways and gathering areas encroach on service areas, loading zones, parking, and utility corridors, which detract from a cohesive image of the Laboratory site.

Vegetation

Annual grasses are the dominant vegetation type on the LBNL site, extending over about one-third of the site. Eucalyptus is the predominant tree, with more than 10 percent of the site covered by stands of blue gum eucalyptus, planted here as elsewhere in the Oakland-Berkeley hills beginning in the late 1800s. More than 25 acres of the site are covered by wooded areas that support coast live oak, California bay, and big-leaf maple trees, and another approximately 7 acres are planted with coast redwood, Monterey pine, Torrey pine, and Canary Island pine. The large areas of native and non-native trees and shrubs give the Lab an aesthetic that is sometimes described as "buildings in nature," as the site structures are, for the most part, scattered amid trees and other vegetation. Although LBNL manages on-site vegetation to reduce the risk of wildland fire, vegetated areas are typically dense enough to visually separate the Laboratory from adjacent residential properties and to serve as a transitional element between the Lab and more rural surroundings to the east. For this reason, vegetated areas are visually compatible with the larger landscape from off-site viewpoints.

The 2006 LRDP distinguishes between the more intensively managed Perimeter Open Space Areas and the less altered Fixed Constraint Areas. However, it is unlikely that an off-site viewer could visually differentiate these areas, as the viewer would likely perceive that both types of undeveloped Lab areas have a similar park-like character.

IV.A.2.2 Views

The Lab is situated near the northeastern perimeter of the UC Berkeley campus in a scenic area that encompasses the Oakland-Berkeley hills and Strawberry and Blackberry Canyons.[1] The hills provide a semi-natural, vegetated open space backdrop to the LBNL hill site. Most areas of the western slopes of these hills are wooded with native stands of oak and California bay or with introduced eucalyptus or conifers. Geographic features, most notably the steep slopes that make

1 This analysis uses true compass directions.

up Strawberry Canyon, define the site's visual setting, and stands of tall trees provide cover for the site from most potential viewpoints in the surrounding region.

The LBNL site is intermittently visible from surrounding short-, medium-, and long-range viewpoints. For purposes of analysis in this EIR, short-range views are those from vantage points on the site, with limited view corridors to or across the site; medium-range views are those from public vantage points up to approximately one mile from the hill site boundary; and long-range views are those from public vantage points greater than one mile away from the hill site.

Medium- and long-range viewing opportunities of and across the site are generally not available due to topographic variation and intervening vegetation. Short-range views are generally available only from on-site roadways and parking areas as well as from within Laboratory buildings. Short-range views include the surrounding hillsides, vegetation, and other LBNL buildings. Because LBNL is a controlled-access site, short-range views are observed primarily by Lab employees and authorized visitors. There are limited opportunities for short-range public views of the site, except for views from locations at the Lawrence Hall of Science upslope from the LBNL site.

The LBNL site is visible in medium-range views from nearby elevated off-site locations, including residential neighborhoods to the north and northwest in the city of Berkeley, such as from Parnassus Road and Hilgard Avenue, and Le Conte Avenue and Ridge Road in the North Side or "Seminary Hill" neighborhood. Nearby and adjacent buildings include several office and research buildings associated with LBNL's Central Research and Administration Area (Buildings 50, 50A-F, 70, 70A) as well as several small office buildings and trailers (Buildings 65, 65A, 65B). Many buildings, walkways, and landscaped areas within the Central Research and Administration Area offer dramatic long-range views of the adjacent communities, San Francisco, and the Bay.

Long-range views of the site are available from locations in downtown Berkeley and from points farther west, such as the Berkeley Marina. Long-range views within the LBNL site are available from locations along north-south axis streets such as Cyclotron Road, from locations with higher elevations to the east of the site along East Road, and from traffic turnouts. These vantage points afford views westward toward the Bay of historic landmarks such as the Golden Gate Bridge and Alcatraz Island, as well as the urban landscape of the adjacent Berkeley and UC campus development.

Due to the site's considerable size and the intervention of buildings, vegetation, and geographical features, the entire LBNL site – or even the majority of the site – is not visible from any single viewpoint (except from overhead by aircraft).

IV.A.2.3 Light and Glare

Sources of light and glare around the hill site are generally limited to the interior and exterior lights associated with development at LBNL, including buildings, parking lots, and access roads. Existing buildings on the hill site can also be considered sources of glare, as some windows and building materials can reflect natural light or nighttime exterior lighting. All on-site buildings and parking areas are equipped with outdoor, downward-directed light fixtures for nighttime lighting and security. In addition, cars and trucks traveling to and from the site represent a source of glare. The LBNL site comprises an internal roadway and circulation network (e.g., Cyclotron Road and East Road) where street lighting causes light and glare effects during early morning and evening hours.

IV.A.2.4 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies contained in the Berkeley and Oakland general plans.

Berkeley General Plan

The Urban Design and Preservation Element of the City of Berkeley Draft General Plan contains few policies related specifically to visual quality that would apply to the proposed 2006 LRDP. Policies relevant to the LBNL include:

> Policy UD-10 The University of California: The City of Berkeley strongly supports actions by the University to maintain and retrofit its historic buildings, and strongly opposes any University projects that would diminish the historic character of the campus or off-campus historic buildings. (Also see Land Use Policies LU-36 and LU-37)

> Policy UD-31 Views: Construction should avoid blocking significant views, especially ones toward the Bay, the hills, and significant landmarks such as the Campanile, Golden Gate Bridge, and Alcatraz Island. Whenever possible, new buildings should enhance a vista or punctuate or clarify the urban pattern.

> Policy UD-32 Shadow: New buildings should be designed to minimize impacts on solar access and minimize detrimental shadows.

Oakland General Plan

The Open Space, Conservation, and Recreation (OSCAR) Element of the City of Oakland's General Plan was adopted in 1996. OSCAR policies pertaining to aesthetics and visual resources with relevance to implementation of the LBNL LRDP include the following:

> Policy OS-10.1: Protect the character of existing scenic views in Oakland, paying particular attention to: (a) views of the Oakland Hills from the flatlands; (b) views of downtown and Lake Merritt; (c) views of the shoreline; and (d) panoramic views from Skyline Boulevard, Grizzly Peak Road, and other hillside locations.

> Policy OS-10.2: Encourage site planning for new development which minimizes adverse visual impacts and takes advantage of opportunities for new vistas and scenic enhancement.

IV.A.3 Impacts and Mitigation Measures

IV.A.3.1 Significance Criteria

For the purposes of this EIR, implementation of the 2006 LBNL LRDP may have a significant effect on visual resources if it would exceed the following Standards of Significance, based on Appendix G of the CEQA Guidelines and the UC CEQA Handbook:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, or historic buildings within a scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

IV.A.3.2 Impact Methodology

Evaluation of potential impacts on the existing visual character of the LBNL site and surroundings requires analysis of the proposed LRDP components that would be introduced. Those new components are then evaluated (separately or collectively) for how they would affect site character and views. Visual simulations illustrating potential future development on the site from eight representative public locations have been prepared and are presented in this section.

The visual simulations are based on an Illustrative Development Scenario illustrated in Figure III-9 in Chapter III, Project Description. This Scenario is intended to provide a conservative basis for the analysis of environmental impacts. Actual overall development that is approved and constructed pursuant to the LRDP would be less intense than portrayed in the scenario. The scenario was developed before the proposed 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. At any particular site, however, the level of development may approach the intensity that is portrayed in the scenario, so the scenario remains an appropriate and conservative basis for evaluating the potential aesthetic impacts of the proposed 2006 LRDP. Also, the actual locations of buildings, configurations, uses, and the like may vary as specific projects are considered and approved in the future, but based on current knowledge the scenario represents a reasonable outcome for the Lab under the LRDP term based on current conditions and needs and best planning. The Laboratory's needs and opportunities will change over time, however, and the scenario is not intended to be a precise representation of the actual development program that would take place over the 20-year planning horizon of the LRDP.

The visual impact analysis is based on field observations of the project site and vicinity conducted in February 2004 and visual simulations completed in April 2006, and a review of aerial and ground-level photography of the project area, U.S. Geological Survey topographic maps, and site plans, architectural drawings, and the landscaping/fire management plan. Photographs used for the visual simulations were taken from public vantage points with a 35-millimeter camera with a 50-millimeter lens.

Before approving any later activity under the LRDP as being within the scope of the project covered by this program EIR, the Lab will evaluate whether the aesthetic impacts of that later activity implemented pursuant to the LRDP were examined in the program EIR. However, as stated in the Introduction to this EIR, as a result of the reduction in scope of the proposed project in response to comments from the City of Berkeley, this EIR (including the Illustrative Development Scenario) will not be used as a first-tier EIR for, or to reduce or streamline the subsequent CEQA processing of, any project that, when added to other construction pursuant to this LRDP, exceeds a net total of 980,000 gross square feet of new occupiable space construction or 320,000 gross square feet of demolition. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3).

IV.A.3.3 2006 LRDP Principles, Strategies, and LBNL Design Guidelines

2006 LRDP Principles and Strategies

The “Vision” section of the 2006 LRDP proposes four fundamental principles that form the basis for the LRDP’s development strategies. The two principles most applicable to aesthetic aspects of new development are to “Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship” and to “Build a more campus-like research environment.” (LRDP, Section 2 – “Vision.”)

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP. (See Chapter III, Project Description, for further discussion, and see Appendix B for a full listing of principles, strategies, and design guidelines.) Development strategies set forth in the 2006 LRDP that are applicable to aesthetics include the following:

- Protect and enhance the site’s natural and visual resources, including native habitats, streams and mature tree stands by focusing future development primarily within the already developed areas of the site;
- Increase development densities within areas corresponding to existing cluster of development to preserve open space, enhance operational efficiencies and access;
- To the extent possible site new projects to replace existing outdated facilities and ensure the best use of limited land resources;

- To the extent possible site new projects adjacent to existing development where existing utility and access infrastructure may be utilized;
- Create a more “collegial” environment that encourages and facilitates interaction among the variety of Berkeley Lab employees and guests;
- Site and design new facilities in accordance with University of California energy efficiency and sustainability policy to reduce energy, water and material consumption and provide improved occupant health, comfort and productivity;
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory;
- Eliminate parking from the sides of major roadways, thereby improving safety and allowing one-way roads to be converted to two-way traffic;
- Maintain or reduce the percentage of parking spaces relative to the adjusted daily population;
- Consolidate parking into larger lots and/or parking structures, locate these facilities near Laboratory entrances to reduce traffic within the main site;
- Remove parking from areas targeted for outdoor social spaces and service areas;
- Preserve and enhance the native rustic landscape and protect sensitive habitats;
- Consolidate service functions wherever possible in the Corporation Yard;
- Improve the pedestrian spaces at the heart of the research clusters and adjacent to research facilities so as to support interaction among Laboratory users;
- Retain and improve walkways as appropriate throughout the open space portions of the site, carefully integrating these pathways to minimize intrusion in the natural environment;
- Improve wayfinding for visitors in particular through a comprehensive and coordinated signage system and through the naming of buildings and research clusters;
- Develop new campus-like outdoor spaces such as plazas within clusters of facilities and improve those that already exist;
- Maintain and enhance tree stands to reduce the visibility of Laboratory buildings from significant public areas in neighboring communities;
- Improve the overall appearance and experience of the Laboratory through improvements to the main entry gates, and the landscape areas associated with roadways, parking lots, and pedestrian pathways;
- Continue to use sustainable practices in selection of plant materials and maintenance procedures;
- Develop all new landscape improvements in accordance with the Laboratory’s vegetation management program to minimize the threat of wildland fire damage to facilities and personnel;

- Utilize native, drought-tolerant plant materials to reduce water consumption; focus shade trees and ornamental plantings at special outdoor use areas; and
- Minimize impervious surfaces to reduce storm water run-off and provide landscape elements and planting to stabilize slopes, reduce erosion and sedimentation.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provide the following specific planning and design guidance for the aesthetic aspects of new development to achieve these design objectives.

The design guidelines would be applied to all new applicable projects constructed at the LBNL main site under the 2006 LRDP program. As part of the design review and approval process, new projects would be evaluated for adherence to the LRDP Land Use Map, the design guidelines, the Building Heights Map, and any other relevant plans and policies. Approvals would be subject to satisfactory compliance with these provisions. Design objectives that are contained within the design guidelines and applicable to the aesthetics analysis include the following:

- Provide screening landscape elements to visually screen large buildings;
- Create landform elements consistent with design on the Hill;
- Mass and site buildings to minimize their visibility;
- Screen roofscapes;
- Respect view corridors;
- Integrate buildings into the overall landscape using appropriate materials;
- Create a cohesive identity across the Lab as a whole by following established precedents for new landscape elements;
- Provide appropriate site lighting for safety and security;
- Create new commons spaces in clusters that currently lack them;
- Allow sunlight to reach the commons spaces;
- Create as high a density and critical mass around commons spaces as possible;
- Create new keystone structures in clusters that currently lack them;
- Utilize artifacts to create identity and add interest to each cluster;
- Create consistency between buildings in individual clusters;
- Develop research clusters in a way that is mindful of future expansion;

- Design pathway layouts that support pedestrian flow and encourage casual interaction;
- Construct new walkway structures such as stairs, bridges, slope retention for walkways and guardrails of materials compatible with the surrounding landscape;
- Minimize visual and environmental impacts of new parking lots;
- Site and design parking structures to integrate with the natural surroundings; and
- Organize service functions to minimize conflicts and visual impacts.

IV.A.3.4 Impacts and Mitigation Measures

Construction[2]-Related Visual Impacts

Impact VIS-1: Construction of the proposed LRDP buildings would create temporary aesthetic nuisances for adjacent land uses. (Less than Significant)

Excavation, grading, and construction activities, including demolition of existing buildings, could create short-term adverse effects on the visual quality of a particular development project site. These activities would occur mostly within developed areas at the hill site but also in undeveloped or vacant areas and would occur during a relatively short period of time – generally 18 to 24 months for a typical building. Grading and excavation, where required, could result in short-term changes in visual conditions, particularly for future projects on relatively steep sites, which could result in an unnatural or engineered appearance where substantial cuts and/or fill are required. These effects normally would be of limited duration, until building construction is underway and/or new or replacement landscaping is installed.

The aesthetic environment during future construction periods would consist of elements typical of a construction site such as bulldozers, trucks, loaders, and excavators, as well as disturbed hillside land and surfaces. Severe angular cuts and/or filling that result in an unnatural or engineered appearance would be avoided where feasible. In addition, graded slopes would be feathered and rounded where feasible to provide a natural transition between the graded site and adjacent un-graded areas. Furthermore, grading would be minimized though the use of retaining walls where compatible with building design.

Removal of trees on future development sites could also cause noticeable changes in the visual environment. The Lab strives to retain mature vegetation where feasible and to plant replacement landscaping as part of all new construction. Where trees were removed, replacement trees would typically be planted or transplanted and positioned to maximize screening benefits. In general, newly built structures tend to stand out in their environment until materials begin to weather and landscaping takes hold.

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2 For the purposes of this EIR, the term "construction," unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

As a new building was constructed, the aesthetic environment of the development site would shift from one dominated by excavation and grading to one focused on construction activity, including erection of the structural framing and, ultimately, exterior finishes. During this time, which would make up the bulk of the 18- to 24-month construction period, activity at the individual project site would be noticeable from short-range viewpoints.

Demolition activities would generally not take as long as construction of new facilities (although they could occur consecutively with construction where new buildings would replace existing ones). Demolition typically would result in lesser visual effects than those described for new construction, because demolition does not generally involve extensive removal of vegetation or grading, and because demolition involves removal of elements of the built environment rather than the introduction of a new structure.

Because of the limited duration and limited geographical extent of demolition and construction projects, and because the hill site's existing vegetation and topographic contours already limit views from off-site, construction activities would be unlikely to adversely affect scenic views, damage scenic resources, or degrade the existing visual character or quality of the hill site, and its surroundings, and therefore construction effects on visual quality would be less than significant.

Mitigation: None required.

Project Variant. The project variant would alter the on-site adjusted daily population but would not result in any change in demolition or new construction compared to what is contemplated under the LRDP. Therefore, visual effects associated with the project variant would be the same as those described for the LRDP.

Individual Future Projects/ Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. The Illustrative Development Scenario includes demolition of certain existing buildings and new construction, and such demolition and construction is consistent with the changes in visual character that would result from implementation of the LRDP. Individual projects identified in the Illustrative Development Scenario would alter existing visual character of the Lab site in the same manner as described above with respect to construction pursuant to the LRDP. Thus, the impact of such construction activities would be less than significant.

Long-Term Visual Impacts

No potentially significant aesthetic impacts are anticipated from Lab activity at sites other than on the main hill site, because no change is proposed at off-site locations. Although periodic fluctuations in the off-site leasing of office or research space would continue to occur over the 2006 LRDP planning period, such leasing has always been conducted in existing buildings, and thus represents use of an existing facility without any aesthetic change. Furthermore, such leasing would occur in building space permitted (and analyzed under CEQA, if applicable) by other entities. Therefore, the following analysis focuses on the LBNL hill site.

Impact VIS-2: The proposed project could alter views of the LBNL site, and could result in a substantial adverse effect to a scenic vista or substantially damage scenic resources. (Significant and Unavoidable)

Overall, implementation of the proposed 2006 LRDP would alter views of the LBNL site from nearby areas, including the Lawrence Hall of Science and residential neighborhoods and commercial areas in the cities of Berkeley and Oakland. This analysis includes views of the site from representative public vantage points, and corresponding conceptual simulations and view diagrams that illustrate how the LBNL site could look after elements of the LRDP's building program are constructed. The simulations are based on buildings identified in the Illustrative Development Scenario, which is a conceptual portrayal of potential development that could occur at particular locations under the 2006 LRDP. This scenario is not a definitive representation of buildout under the LRDP. Rather, the simulations are intended to represent potential visual changes to the LBNL main hill site.

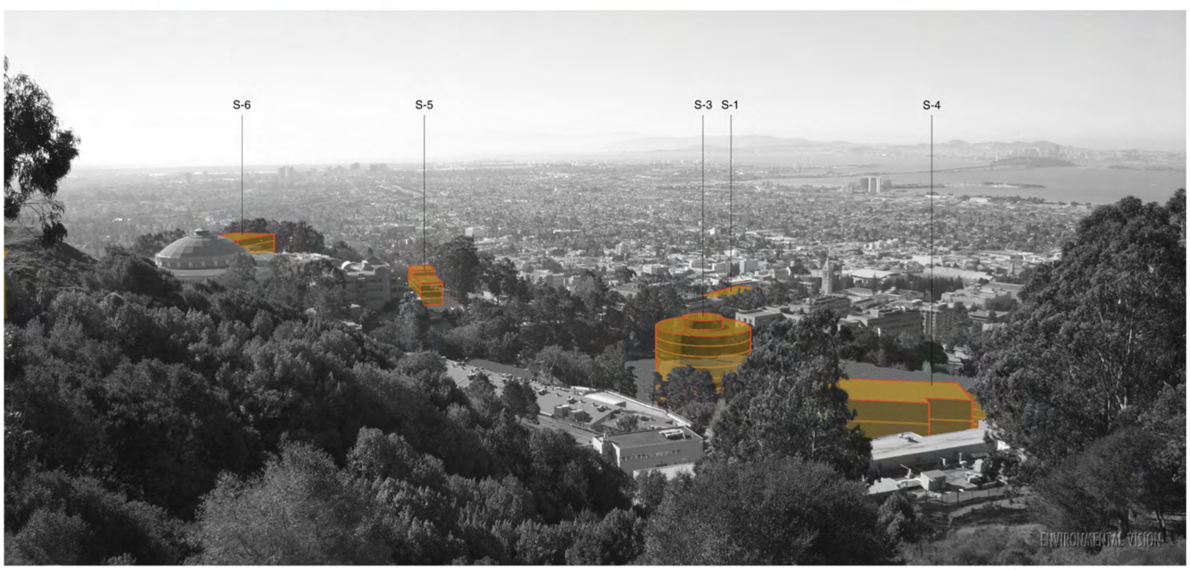
Figure IV.A-1 (p. IV.A-2) illustrates the locations of the viewpoints included in this analysis.

Figures IV.A-2 and IV.A-3 depict existing views from two locations at the Lawrence Hall of Science: the north parking lot and the outdoor exhibit area, respectively. Both views are looking west-southwest. For purposes of this EIR, these views are considered short-range views because they provide wide views of the hill site from publicly accessible locations north of the site. Foreground views consist of sloping hillsides covered in shrubbery and trees. Breaks in the vegetation give way to mid-ground views of the LBNL site. From this perspective, the most prominent visible element on the LBNL skyline is the dome of the Advanced Light Source (Building 6) to the south (at left in Figure IV.A-2 and in the center of Figure IV.A-3). Adjacent to the Advanced Light Source, Buildings 80 and 2 are visible. In the middle of the mid-ground views, the rooftops of Buildings 58, 47, and 46 are visible as a flat surface tucked against the hillside. To the west in Figure IV.A-2, the smaller dome of the Bevatron (Building 51) and the top of Building 54 are discernible. Background views include the UC Berkeley campus; the cityscapes of Oakland, Berkeley, and San Francisco; San Francisco Bay, the Bay Bridge, and Treasure Island; and wide expanses of sky "panoramic views." New construction would be in conformance with height zones delineated in the Building Heights Map to assure that long-range or panoramic views from these vantage points would not be obstructed.

Under LRDP conditions, views from these vantage points would change. Foreground views in Figure IV.A-2 would continue to comprise the hillside sloping southwestward to the developed terrace portion of the LBNL hill site. In mid-ground views, additional buildings anticipated under the proposed project would be visible; some of these new buildings would be built adjacent to existing structures, while others would replace existing structures. As shown in the simulation, these buildings would generally be clustered near the Advanced Light Source and also at the current location of the Bevatron, although the rooftop of a new building (Building S-4) west of this cluster of buildings would also be visible. (For a list of potential new buildings under the Illustrative Development Scenario, see Table III-6 in Chapter III, Project Description.) The western portion of this view is proposed to be altered by demolition of the Bevatron (Building 51) and new replacement construction. Certification of the Building 51 (Bevatron) EIR and approval

Existing view from Lawrence Hall of Science North Parking Area (below Summit Road residences)

Conceptual visual simulation of Proposed Project



View Diagram of Proposed Project

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure IV.A-2
Site Photo and Simulation

Existing view from Lawrence Hall of Science outdoor exhibit area

Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure IV.A-3
Site Photo and Simulation

of the demolition project are anticipated to be considered in early 2007. In the simulation in Figure IV.A-3, from a vantage point slightly to the south, the foreground view would be dominated by the new Building S-7 which would be situated between the viewpoint and the Advanced Light Source, and which would replace many of the existing buildings in the Lab's Old Town area. Limited portions of two additional buildings would also be visible, generally to the southwest and west of Building S-7. No change would occur in long-range scenic views (i.e., of San Francisco Bay) from these viewpoints, and no scenic resources would be damaged.

Figures IV.A-4 and IV.A-5 illustrate long-range views of the LBNL hill site from downtown Berkeley, looking east. In Figure IV.A-4, the intersection of Shattuck Avenue and Center Street dominates the foreground, while existing buildings in Berkeley and extensive tree canopies occupy the mid-ground. In the background, a portion of the LBNL hill site is visible between more proximate buildings and trees. Portions of several existing Lab buildings can be seen scattered among the trees on the hillside, although none is readily identifiable because of the extensive vegetation on the hill site. From the vantage point in Figure IV.A-5, at Hearst and Shattuck Avenues, foreground views include expanses of paved roadway (Hearst Avenue) framed by low- to medium-density buildings. Mid-ground views are also of buildings along Hearst Avenue. In the background, the view corridor terminates at the rising hills of the LBNL site. Several LBNL buildings are visible from this location, in some cases more clearly defined than in Figure IV.A-4. Most notable are Building 50 and the dome of the Advanced Light Source. Building 90 (to the northeast on the top of the hill) and Building 88 are partially visible; however, much of the hillside is screened or obscured by existing vegetation.

The simulations in both Figures IV.A-4 and IV.A-5 depict several new buildings included in the Illustrative Development Scenario, although, as under existing conditions, most would be largely obscured by trees and other vegetation. The most notable new structures in the simulations are the two buildings apparent in Figure IV.A-4, Parking Garage PS-1, which would be constructed at the site of an existing surface parking lot at the head of Blackberry Canyon, and Building S-4, farther upslope, behind the existing Bevatron site. Most of the buildings depicted in the simulation in Figure IV.A-5 are visible only as incomplete facades, partially hidden by existing vegetation and existing structures. Building S-1 would be the most prominent new structure and the upper portion of the building's western façade would be visible from this vantage point. In general, views of the Lab hill site would be incrementally intensified because additional buildings would be visible. In most instances, however, direct views of any one specific building would not be possible. No buildings would be constructed of a height and/or without sufficient screening such that they would dramatically stand out from existing Lab development in long-range views of the hillside. Under the 2006 LRDP, evaluation of building height and landscaping would be instituted as an integral part of the design review process. It is noted that reproduction of the photographs and visual simulations limits to some degree the clarity of the image portrayed. Therefore, while the views and visual simulations depicted in Figures IV.A-4 and IV.A-5 and the other visual simulations in this section are intended to illustrate potential visual changes, the degree of change perceived by observers will vary. For example, some observers could be more keenly aware of any increase in building intensity on the Lab's main hill site, and these observers could find the changes depicted in Figures IV.A-4 and IV.A-5 to be substantially disruptive.

Existing view from Shattuck Avenue at Center Street

Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure IV.A-4
Site Photo and Simulation

Existing view from Hearst Avenue at Shattuck Avenue

Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

Figure IV.A-5
Site Photo and Simulation

Figure IV.A-6 illustrates a long-range view of the hill site from University Avenue and San Pablo Avenue looking east. From this location, foreground views are dominated by the street and mainly low-rise commercial/mixed-use buildings. Mid-ground views are of vegetation strips in the traffic island located in the center of University Avenue. In the background, the dome of the Advanced Light Source and other building forms are visible. As illustrated in the simulation, a number of future LRDP buildings included in the Illustrative Development Scenario would be visible. New buildings shown in the simulation would range between two and eight stories in height and the visual change associated with construction of new buildings would be apparent because, in this viewpoint, existing development on the LBNL hill site comprises only a small fraction of the visible setting, and because there is less dense vegetation in the setting than is the case from some other viewpoints. Nevertheless, with the buildings shown in the simulation, the developed portion of the LBNL hill site would continue to be less extensive than the vegetated areas of the hill site, and new buildings would be partially obscured by vegetation and topography, similar to present conditions. As with the views shown in Figures IV.A-4 and IV.A-5, the project would affect a scenic vista and scenic resources, to varying degrees, depending on the observer, and some observers could find the changes disruptive.

As described above, most new development under the 2006 LRDP as described by the Illustrative Development Scenario would be partially or largely obscured by existing vegetation and topography. Additionally, the Lab would continue to implement its existing policies for revegetation and landscaping, with an emphasis on the use of native plants and trees. Guidance in the LRDP and the Design Guidelines call for, among other things, clustering new development primarily in existing developed areas and providing screening landscape elements to visually screen large buildings and to mass and site buildings to minimize their visibility.

Given that the Lab's hill site would continue to appear as a vegetated hillside with buildings among trees and shrubs, that the natural and manmade topography of the site limits views from any one vantage point to a relatively small portion of the hill site, and that development under the LRDP would be guided by the LRDP principles and strategies and LBNL Design Guidelines, it is likely that many observers would not consider the changes in the existing visual setting to be substantial. Also, many individual projects or buildings that could be constructed pursuant to the LRDP would not result in a substantial change. As noted previously, however, visual quality is subjective, and different observers may have different reactions to changes in long-range views of the Lab's hill site, with some people likely to find some of the increases in building density, even though partially screened, to be disruptive or even offensive. Even though the changes to the site would occur in the context of existing development and not affect pristine views, some of the visual impacts would appear substantial to at least some viewers. In other instances, while the overall visual character of the site may remain similar, there may be substantial new buildings included in the vista. Given that aesthetic impacts are inherently somewhat subjective, and given the totality of potential development even though many individual buildings would not have a substantial effect, and also to provide a conservative analysis that avoids any possible under-estimation of impacts, this EIR concludes that the proposed LRDP, as described by the Illustrative Development Scenario shown in the visual simulations, would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially

Existing view from University Avenue at San Pablo Avenue

Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

Figure IV.A-6
Site Photo and Simulation

damage scenic resources. In light of the above, the project's effect on aesthetics and visual quality is determined to be significant.

Mitigation: No mitigation is identified beyond the implementation of the LBNL Design Guidelines and the accompanying policy direction in the draft LRDP, and this impact is considered significant and unavoidable. However, Chapter V of this EIR includes the Reduced Growth 1 Alternative, which would result in lesser changes in the visual environment by constructing less overall building square footage and buildings of reduced height and mass. This alternative would result in lesser aesthetic impacts than would the proposed project.

Project Variant. The project variant would alter the on-site adjusted daily population but would not result in any change in buildings or structures developed, compared to what is contemplated under the LRDP. Therefore, effects on scenic vistas and scenic resources would be the same as those described for the proposed LRDP and would be considered significant.

Individual Future Projects/ Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. The Illustrative Development Scenario includes demolition of certain existing buildings and new construction, and such demolition and construction are consistent with the changes in visual character that would result from implementation of the LRDP. Individual projects identified in the Illustrative Development Scenario would alter existing scenic vistas and resources in the same manner as described above with respect to construction pursuant to the LRDP. Thus, while the impact of many of the individual buildings in the Illustrative Development Scenario would not be substantial or significant, overall the aesthetic impact of such construction activities would be significant.

Impact VIS-3: The proposed project would alter the existing visual character of the Lab site and could substantially degrade the existing visual character and quality of the site and its surroundings. (Significant and Unavoidable)

Implementation of the 2006 LRDP would result in visual and aesthetic changes at the LBNL hill site and could alter the site's character visible from certain public vantage points. Changes would be associated with (1) demolition of specific existing buildings, (2) development of new buildings, (3) proposed landscaping and other on-site improvements, and (4) the pattern of clustered development.

The Illustrative Development Scenario upon which the visual simulations are based assumes demolition of approximately 440,000 square feet of existing building space on the hill site over a period of about 20 years to accommodate future uses. Aesthetic changes are expected to be the greatest within the Old Town area, adjacent to the Advanced Light Source (Building 6), where the demolition of about 30 buildings and structures and replacement with new structures are proposed. Redevelopment of this area would remove low-profile, temporary trailers and other low-rise structures of moderate to low visual quality and allow for the eventual construction of contemporary lab/office buildings with improved amenities tailored to LBNL's future research needs.

Project-related changes to the hill site would be based on development patterns that generally follow the Illustrative Development Scenario, which provides a conceptual portrayal of potential development under the LRDP. The photo simulations in Figures IV.A-7 through IV.A-9, discussed below, illustrate possible building massing, height and approximate placement that could be developed under the 2006 LRDP. The photo simulations are taken from representative public vantage points and are intended to reflect the worst-case visual impact; that is, the locations from which the greatest change would be visible to the public from off-site locations. The actual locations of new buildings, configurations, uses, and other development features may vary, and other potential scenarios for development under the LRDP would be possible, but they would likely involve the same intensity of development (i.e., essentially the same amount of building space) and therefore effects on the visual character of the site would be expected to be similar. Proposed building demolition and new construction, as well as proposed parking lots and structures, are presented in Chapter III, Project Description (see Tables III-6 and III-7).

Individual projects identified at this time have not undergone detailed design, although it is anticipated that future buildings on the LBNL site would be developed based on the 2006 LRDP's development cluster concept, in which research and academic uses would be constructed in close proximity. Each research or academic cluster would consist of a group of buildings around open space such as a plaza or quad, and distinctly bounded by discernible edges, generally in the form of undeveloped parts of the Lab site. As proposed by the LRDP, each cluster would consist of a "keystone" or signature building that would serve as a visual landmark and would be the principal reflection of the design concept of all buildings within that cluster. Six development clusters have been identified in the LRDP; these would be organized around existing facilities (see Figure III-7 in Chapter III, Project Description). The cluster concept would guide development at other areas on the site and result in an alteration of visual quality and character.

The 2006 LRDP calls for the demolition of some buildings and the amalgamation of existing and future uses into a select number of new buildings that would be constructed in already developed portions of the site. While the building envelopes of future structures could be larger than the smaller, temporary structures they would replace, it is anticipated that future buildings would be designed to avoid adverse impacts on the character of the site. The heights of future buildings could range from one to eight stories, although future projects would typically be two to four stories, consistent with the site's existing permanent buildings. Figure III-6 in Chapter III, Project Description, illustrates the proposed height districts on the hill site, which are part of the LBNL Design Guidelines, a companion document to the LRDP and a required consideration under the design review process for future projects. While future buildings would be generally in scale with buildings they would surround and within already developed portions of the site to allow for more efficient site planning, some buildings would be larger than existing structures or would be constructed in areas that are predominately undeveloped. These changes could substantially alter the site's character as depicted in Figures IV.A-7 through IV.A-9.

Figure IV.A-7 shows an existing view into the LBNL East Canyon area, looking north from approximately the easternmost extent of Centennial Drive, where an existing crosswalk provides access to the UC Berkeley Botanical Garden. The existing view from this location, near the

Existing view from Centenial Drive crosswalk at Botanical Garden

Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure IV.A-7
Site Photo and Simulation

Existing view from Panoramic Way

Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure IV.A-8
Site Photo and Simulation

Existing view from Ridge Road at Euclid Avenue

Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure IV.A-9
Site Photo and Simulation

LBNL Strawberry Canyon Gate, is primarily of utilitarian structures including stairs and a ramp that provide pedestrian access to LBNL; a number of light standards; signage, including a bus stop sign and a bench; utility infrastructure; and some small buildings. While trees and other vegetation are dominant elements in the view, along with the open sky, the scene is not one of an undeveloped, natural environment, but rather of a built environment within the wooded East Bay hills.

The simulation in this figure depicts potential major new LBNL development in the East Canyon, where the Lab's Life Sciences cluster currently exists, and therefore represents one of the most dramatic potential visual changes under the 2006 LRDP. Two relatively large buildings depicted in the simulation (S-13 and S-14) are identified in the Illustrative Development Scenario, which represents a conceptual portrayal of development under the LRDP. The introduction of the new buildings to this area would represent a relatively substantial change to the visual character. As noted above, the change would occur in an already developed area, and both existing vegetation and open sky would continue to be prominent elements in the resulting scene. Moreover, the simulation presents only an illustration of the potential massing of the new buildings, without fenestration (windows), articulation, or other architectural detail, and the incorporation of the guidance within the LRDP and the LBNL Design Guidelines would be expected to minimize the impact of new buildings when the final design is developed. Although development pursuant to the LRDP would occur within the already substantially developed Lab hill site, adjacent to and in proximity to existing buildings and other manmade elements, the visual change would likely be considered by some observers to adversely affect the visual character of the site or its surroundings. Also, while many of the individual buildings that could be constructed pursuant to the 2006 LRDP would not result in a substantial visual change, the total amount of visual alteration under the 2006 LRDP could be perceived as substantial. Therefore, for purposes of a conservative assessment, the impact is considered significant.

Figure IV.A-8 shows an existing view into the LBNL site from the Panoramic Hill neighborhood on the Berkeley-Oakland border, looking north from Panoramic Way. Foreground views are composed of vegetation and the roofs of a single-family home fronting Panoramic Way.[3] Mid-ground views are of Lawrence Drive and trailers on the LBNL site. The existing Building 31 is visible, as is a portion of Building 77A, farther up the hillside and largely obscured by trees. The simulation in this figure depicts a three-story building (S-9) (identified in the Illustrative Development Scenario) that steps up the sloping hillside, a small portion of a proposed retaining wall situated below and to the east of Building S-9, and very small portions of other potential new buildings (S-10, S-11 and S-13) in the East Canyon area partially visible through the trees to the right. This view of this site, considered a fleeting view through a small break in existing vegetation, is generally not available to the public, although it could be noticeable to Panoramic Hill residents. New development at the LBNL site illustrated in this simulation would be apparent and would alter the site's character by increasing the intensity of the built environment. The new development could be found by some people (especially area residents) to adversely affect the visual character of the site and its surroundings, given that the development would result in

3 The photograph depicting this view was shot through a small break in the vegetation along Panoramic Way and depicts one of the few publicly accessible viewpoints of Berkeley Lab from the Panoramic Hill neighborhood. Dense vegetation screens most views toward the Lab from public streets .

additional building volume and footprint within this view. In light of the above, for purposes of a conservative assessment, the impact is considered to be significant.

The view in Figure IV.A-9 is from the Northside residential neighborhood of Berkeley, looking east into the Lab hill site along Ridge Road from Euclid Avenue. Foreground and mid-ground views are of tree-lined, moderate-density residential streets. Existing Lab buildings clearly visible include Building 71 atop the ridgeline and portions of the Building 50 complex to the right (immediately left of the telephone pole in the foreground). This view is clearly of a developed area; existing residences, streets and sidewalks, vehicles, and utility structures are the dominant elements in the scene. The Lab's hill site forms the background in this view, along with open sky.

In the simulation from this viewpoint, several new LBNL buildings included in the Illustrative Development Scenario are visible, and the Parking Garage PS-1 and Building S-4, farther upslope, are prominent. The upper portion of Building S-3 peeks out from the trees at the upper right. Because of its location at the head of Blackberry Canyon, Parking Garage PS-1 would be readily visible from this viewpoint. Other new LBNL development would be somewhat obscured by existing vegetation, as is shown in all of the simulations for most new development on the hill site. The new structures would increase the intensity of the built environment on the hillside and alter the character of the hillside. As in the other views discussed above, the change is anticipated to be perceived by some observers as an intrusive one that could substantially alter background elements in the scene, reducing the amount of hillside vegetation and replacing some of the greenery with new development on the Lab site. Therefore, the visual change is considered to result in a significant adverse impact.

New development would not necessarily result in a substantial change in the site's character, either from all viewpoints illustrated in Figures IV.A-2 through IV.A-6 or in the opinion of all observers. While the site's character would continue to appear as a primarily vegetated hillside with buildings among trees and shrubs, and while implementation of the LRDP Principles and Strategies and the LBNL Design Guidelines would be expected to reduce potential effects on visual character, some new buildings allowable under the LRDP could be more visually intrusive than under existing conditions, particularly to some observers. As a result, it is anticipated that some observers would perceive a substantial adverse change in the on-site visual character from construction of individual buildings. Even though the changes to the site would occur in the context of existing development and not affect pristine views, some of the visual impacts of some buildings would appear substantial to at least some viewers. For example, potential development shown in Figure IV.A-7 would introduce substantial building massing in front of an existing tree line viewed from a public street. In other instances, while the overall visual character of the site may remain similar, there may be substantial new buildings included in the vista. Given that aesthetic impacts are inherently somewhat subjective, and also to provide a conservative analysis that avoids any possible under-estimation of impacts, this EIR concludes that the change in visual character that could result from overall development under the 2006 LRDP, as described by the Illustrative Development Scenario and the representative visual simulations, could potentially alter the site's character in a substantial and adverse manner. Thus, for purposes of a conservative assessment, and even though many of the buildings that could be constructed pursuant to the 2006

LRDP would not result in a significant impact, this EIR concludes that the project's impact on visual character would be significant.

Mitigation: No mitigation is identified beyond the implementation of the LBNL Design Guidelines and the accompanying policy direction in the draft LRDP, and this impact is considered significant and unavoidable. However, Chapter V of this EIR includes the Reduced Growth 1 Alternative, which would result in lesser changes in the visual environment by constructing less overall building square footage and buildings of reduced height and mass. This alternative would result in lesser aesthetic impacts than would the proposed project.

Project Variant. The project variant would alter the on-site adjusted daily population but would not result in any change in buildings or structures developed compared to what is contemplated under the LRDP. Therefore, visual character impacts would be the same as those described for the proposed LRDP and would be significant.

Individual Future Projects/ Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. The Illustrative Development Scenario includes demolition of certain existing buildings and new construction, and such demolition and construction are consistent with the changes in visual character that would result from implementation of the LRDP. Individual projects identified in the Illustrative Development Scenario would alter the existing visual character of the Lab site in the same manner as described above with respect to construction pursuant to the LRDP. The impact would be considered significant for the same reasons stated above.

Light and Glare Impacts

Impact VIS-4: Implementation of the LRDP would introduce new sources of light and glare into the LBNL site and increase the overall level of ambient light in the site vicinity. (Significant; Less than Significant with Mitigation)

Implementation of the 2006 LRDP would result in construction of new buildings that would incrementally increase existing lighting levels on the hill site. The LRDP proposes future buildings in portions of the developed hillside terrace area of LBNL that include other buildings that are themselves sources of light and glare.

Anticipated new buildings would generate additional light in several ways. First, light from the interior of the building would be visible through building windows. Second, lighting fixtures would be affixed to outdoor areas at the building entry for safety and security. Finally, lighting fixtures may also be placed around building perimeters for safety and security.

> **Mitigation Measure VIS-4a:** All new buildings on the LBNL hill site constructed pursuant to the 2006 LRDP shall incorporate design standards that ensure lighting would be designed to confine illumination to its specific site, in order to minimize light spillage to adjacent LBNL buildings and open space areas. Consistent with safety considerations,

LBNL project buildings shall shield and orient light sources so that they are not directly visible from outside their immediate surroundings.

Mitigation Measure VIS-4b: New exterior lighting fixtures shall be compatible with existing lighting fixtures and installations in the vicinity of the new building, and will have an individual photocell. In general, and consistent with safety considerations, exterior lighting at building entrances, along walkways and streets, and at parking lots shall maintain an illumination level of not more than 20 Lux (approximately 2 foot-candles).

Mitigation Measure VIS-4c: All new buildings on the LBNL hill site constructed pursuant to the 2006 LRDP shall incorporate design standards that preclude or limit the use of reflective exterior wall materials or reflective glass, or the use of white surfaces for roofs, roads, and parking lots, except in specific instances when required for energy conservation.

Significance after Mitigation: Less than significant.

Project Variant. The project variant would alter the on-site adjusted daily population but would not result in any change in buildings or structures developed, compared to what is contemplated under the LRDP. Therefore, light and glare impacts would be the same as those described for the proposed LRDP and would be less than significant with implementation of Mitigation Measures VIS-4a, VIS-4b, and VIS-4c.

Individual Future Projects/ Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. The Illustrative Development Scenario includes demolition of certain existing buildings and new construction, and such demolition and construction are consistent with the changes in visual character that would result from implementation of the LRDP. Individual projects identified in the Illustrative Development Scenario would alter the existing visual character of the Lab site in the same manner as described above with respect to construction pursuant to the LRDP. Thus, the impact of such construction activities would be less than significant with implementation of Mitigation Measures VIS-4a, VIS-4b, and VIS-4c.

IV.A.3.5 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex—housing the Bevatron accelerator—although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Additional projects currently underway at UC Berkeley, described in Section VI.C, Cumulative Impacts, of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis includes areas from which Berkeley Lab is visible to the public from exterior viewpoints. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.A-7) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact VIS-5: Implementation of the LRDP, in conjunction with cumulative development, would alter the visual character of, and change views of, the Oakland-Berkeley hills in the vicinity of Berkeley Lab. (Less than Significant)

Lands northeast of the Lab and farther eastward into the East Bay hills are managed by the East Bay Regional Park District (EBRPD). The EBRPD does not have plans to build large facilities, remove large groves of trees, or otherwise develop its lands within the short- and medium-range viewsheds analyzed in this EIR.[4] The City of Berkeley extends into the hill area adjacent to and north of the Lab. City zoning for the hill area is single-family residential with a maximum floor area ratio of 0.4 for any given lot. In accordance with the City's latest General Plan, no large buildings would be developed in this area and existing developed areas – which are largely built out – would be limited in the degree of new development that could occur.[5] The areas of Oakland near LBNL under City of Oakland jurisdiction are designated Hillside Residential in the Oakland General Plan and zoned either Low Density or Single Family.[6]

Given the above land use controls, little or no development beyond that proposed at Berkeley Lab under the 2006 LRDP is anticipated in the Oakland-Berkeley hills in the general area of LBNL during the approximately 20-year planning horizon of the LRDP. UC Berkeley does not propose substantial new development on its hill site, and much of the remaining surrounding area is park or open space land. Therefore, little development of consequence that would be visible to

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[4] The EBRPD does have several maintenance projects planned for Tilden Regional Park, including a weather-tight enclosure and fire sprinkler for the historic merry-go-round and installation of new chemical toilets, with proceeds from the voter-approved Measure CC parcel tax of November 2004. However, these projects would not result in substantial visual change. In addition, the EBRPD will use Measure CC funds to "manage vegetation for fuels reduction in coordination with the protection and enhancement of wildlife habitat in fuel break areas to provide defensible space near structures and meet the Hills Emergency Forum 8' flame length standard" in both Tilden Park and Claremont Canyon Regional Preserve. (Source: Measure CC Update, EBRPD website, viewed May 21, 2005 at http://www.ebparks.org/district/measurecc_update.htm.)

[5] The entire hill area that is outside University of California (including LBNL) control is designated Low Density Residential on the Berkeley General Plan land use diagram (viewed on city website May 21, 2005, at http://www.ci.berkeley.ca.us/maproom/Maps/gplandusemap.htm). Low density residential is described in the General Plan Land Use Element as follows: "These areas are generally characterized by single-family homes. Appropriate uses for these areas include: residential, community services, schools, home occupations, recreational uses, and open space and institutional facilities. Building intensity will range from one to 10 dwelling units per net acre, not including secondary units, and the population density will generally not exceed 22 persons per acre. For information purposes, the compatible zoning districts for this classification are: Single Family Residential (R-1), which allows approximately 9 principal dwelling units/acre (plus a second unit per parcel, as mandated by state law) and Environmental Safety- Residential (ES-R), which allows approximately 5 dwelling units per acre. Height limits in these zoning districts are typically 28 feet with provisions to allow up to 35 feet" (viewed on website May 21, 2005, at http://www.ci.berkeley.ca.us/planning/landuse/plans/generalPlan/landUse.html).

[6] As with Berkeley zoning, these zoning designations allow no more than one unit per lot, plus a secondary unit as mandated by state law. General plan and zoning map viewed on city website May 21, 2005, at http://www.oaklandnet.com/government/ceda/revised/planningzoning/ZoningSection/ZoningMapFinal.pdf.

observers who also would see the Berkeley Lab hill site is expected other than development pursuant to the 2006 LRDP.

The Final EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) finds that the SCIP would result in significant unavoidable visual impacts resulting from effects on the character of Gayley Road due to construction of a new parking structure and on views from Panoramic Hill due to improvements to Memorial Stadium (UC Berkeley, 2006). However, these impacts would be specific to the Integrated Projects analyzed in the SCIP EIR; implementation of the LBNL 2006 LRDP would not result in changes in views from the same viewpoints, and thus would not combine with the impacts of the Integrated Projects. Therefore, the LRDP's contribution to any cumulative impacts resulting from implementation of the Integrated Projects would be less than significant.

Because the 2006 LRDP development (with mitigation) would not result in significant visual or light and glare impacts, because little other development is expected that could result in overlapping (cumulative) visual impacts, and because the LRDP would not result in adverse impacts that would occur in combination with the UC Berkeley Integrated Projects, the cumulative aesthetic effects of the 2006 LRDP would be less than significant.

Mitigation: None required.

Project Variant. The project variant would alter the visual character of, and change views of, the Oakland-Berkeley hills in the vicinity of Berkeley Lab in substantially the same manner as the 2006 LRDP development. The cumulative aesthetic effects of the project variant would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. A future project under the LRDP such as conceptually portrayed in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development as discussed above, would also, for the reasons stated above, result in a cumulative aesthetic impact that would be less than significant.

IV.A.4 References – Aesthetics and Visual Quality

City of Berkeley, *City of Berkeley Draft General Plan EIR*, City of Berkeley. Available online at http://www.ci.berkeley.ca.us/planning/landuse/plans/generalPlan/EIR/00toc.html. 2001.

City of Berkeley, *City of Berkeley General Plan*, 2002.

Lawrence Berkeley National Laboratory, *Draft and Final Environmental Impact Report for the 1987 Site Development Plan*, (SCH# [19]85112610), August 1987.

Lawrence Berkeley National Laboratory, *Draft and Final Supplemental Environmental Impact Report (FEIR) for the Proposed Construction and Operation of the Building 49 Project*, SCH# 2003062097, prepared by the Lawrence Berkeley Laboratory, with the assistance of Environmental Science Associates, Inc., December 2003.

UC (University of California) Berkeley, *Southeast Campus Integrated Projects Tiered Focused Final Environmental Impact Report (SCH #2005112056)*, October 31, 2006. Available online at http://www.cp.berkeley.edu/SCIP/FEIR/SCIP_DEIR.html.

IV.B. Air Quality

IV.B.1 Introduction

This section evaluates the potential air quality impacts of the proposed 2006 LRDP. This section discusses the regulatory framework for air quality management and the existing air quality conditions in the project area, and it analyzes the potential for the project to affect existing air quality conditions, both regionally and locally, from activities that emit radioactive and non-radioactive materials. It also analyzes the types and quantities of emissions that would be generated on a temporary basis due to project construction and over the long term due to project operation.

The analysis in this section is based on a review of existing air quality conditions in the region and air quality regulations administered by the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and the Bay Area Air Quality Management District (BAAQMD). This includes *CEQA Guidelines* established by the BAAQMD, December 1999; and the *Bay Area 2005 Ozone Strategy,* also prepared by the BAAQMD, January 2006. Other sources of information used in this chapter include various LBNL documents, the general plans for the cities of Berkeley and Oakland, the EIR for the Berkeley General Plan, and the *University of California CEQA Handbook* prepared by the UC Office of the President.

Where relevant, this section presents estimates of future emissions based on standard air quality modeling techniques. This section also presents the results of a health risk assessment undertaken to evaluate potential effects that could result from human exposure to emissions of toxic air contaminants generated by expected growth and development of LBNL.

IV.B.2 Setting

Air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions, including wind speed, wind direction, and air temperature, in combination with local surface topography (i.e., geographic features such as mountains, valleys, and San Francisco Bay), determine the effect of air pollutant emissions on local air quality.

IV.B.2.1 Climate and Meteorology

The project site is located in the cities of Berkeley and Oakland within the boundaries of the San Francisco Bay Area Air Basin (Bay Area). The Bay Area's moderate climate steers storm tracks away from the region for much of the year, although storms generally affect the region from November through April. Berkeley's proximity to the refreshing onshore breezes stimulated by the Pacific Ocean provide for generally very good air quality at LBNL. However, during the ozone smog season (typically, May through October), transport studies have shown that ozone precursor emissions generated in Oakland and Berkeley are often transported to other regions of the Bay Area and beyond (e.g., Central Valley) that are more conducive to the formation of ozone smog. In the winter, reduced solar energy and cooler temperatures diminish ozone smog formation, but increase the likelihood of carbon monoxide formation.

Temperatures in the LBNL area average in the mid-fifties annually, generally ranging from the low-forties on winter mornings to mid-seventies during summer afternoons. Daily and seasonal oscillations of temperature are small because of the moderating effects of the nearby ocean. In contrast to the steady temperature regime, rainfall is highly variable and confined almost exclusively to the "rainy" period from November through April. About 95 percent of the average annual rainfall of approximately 30 inches at the LBNL site occurs during this period. Precipitation may vary widely from year to year as a shift in the annual storm track of a few hundred miles can mean the difference between a very wet year and drought conditions. Winds in the project area display several characteristic regimes. During the day, especially under fair weather conditions, winds are from the west and northwest as air is funneled through the Golden Gate toward the Laboratory. At night, cooling of the land generates winds from the east and southeast. Summer afternoon sea breezes typically range from 20 to 30 miles per hour. Peak annual winds occur during winter storms. South and southeast winds typically also precede weather systems passing through the region.

IV.B.2.2 Criteria Air Pollutants

As required by the federal Clean Air Act passed in 1970, the United States Environmental Protection Agency has identified six criteria air pollutants that are pervasive in urban environments and for which state and federal health-based ambient air quality standards have been established. EPA calls these pollutants criteria air pollutants because the agency has regulated them by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. Ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead are the six criteria air pollutants.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx). ROG and NOx are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NOx under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to its formation and accumulation. Ground level ozone in conjunction with suspended particulate matter in the atmosphere leads to hazy conditions generally termed as "smog."

Carbon Monoxide

Carbon monoxide, a colorless and odorless gas, is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicles. High carbon monoxide concentrations develop primarily during winter when periods of light wind combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased carbon monoxide emission rates at low air temperatures. When inhaled at high concentrations, carbon monoxide combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Nitrogen Dioxide

Nitrogen dioxide is an air quality concern because it acts as a respiratory irritant and is a precursor of ozone. Nitrogen dioxide is produced by fuel combustion in motor vehicles, industrial stationary sources, ships, aircraft, and rail transit.

Sulfur Dioxide

Sulfur dioxide is a combustion product of sulfur or sulfur-containing fuels such as coal and oil, which are restricted in the Bay Area. Its health effects include breathing problems and may cause permanent damage to lungs. Sulfur dioxide is an ingredient in acid rain (acid aerosols), which can damage trees, lakes, and property. Acid aerosols can also reduce visibility.

Particulate Matter

PM-10 and PM-2.5 consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. A micron is one-millionth of a meter, or less than one-25,000th of an inch. For comparison, human hair is 50 microns or larger in diameter. PM-10 and PM-2.5 represent particulate matter of sizes that can be inhaled into the air passages and deep into the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of aerosol-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles (PM-2.5) of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility.

Particulate matter emissions in a setting like Berkeley Lab are mainly from urban sources, dust suspended by vehicle traffic and secondary aerosols formed by reactions in the atmosphere. Particulate concentrations near residential sources generally are higher during the winter, when more fireplaces are in use and meteorological conditions prevent the dispersion of directly emitted contaminants.

Lead

Leaded gasoline (phased out in the United States beginning in 1973), paint (on houses, cars), smelters (metal refineries), and manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects; children are at special risk. Some lead-containing chemicals cause cancer in animals.

IV.B.2.3 Toxic Air Contaminants

The California Health and Safety Code defines toxic air contaminants (TACs) as air pollutants “which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health” (Health and Safety Code Section 39655(a)). By definition, TACs include substances listed in the federal Clean Air Act as “hazardous air pollutants.” TACs are less pervasive in the urban atmosphere than criteria air pollutants, but are linked to short-term (acute) or long-term (chronic and/or carcinogenic) adverse human health effects. There are hundreds of different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust. Unlike regulations concerning criteria air pollutants, there are no ambient air quality standards for evaluation of TACs based on the amount of emissions. Instead, emissions of TACs are evaluated based on the degree of health risk that could result from exposure to these pollutants.

As noted above, the federal Clean Air Act refers to the term “hazardous air pollutants” while California regulations use the term “toxic air contaminants.” “Toxic air contaminants” will be the term used in this document.

IV.B.2.4 Regulatory Context

EPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal ambient air quality standards and judging the adequacy of State Implementation Plans (SIP). However, EPA has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented. In California, CARB is responsible for establishing and reviewing the state ambient air quality standards, developing and managing the California SIP, securing approval of this plan from EPA, and identifying TACs. A notable exception, which affects Berkeley Lab, exists for radioactive air contaminants as the EPA has retained its authority to enforce its National Emissions Standards for Hazardous Air Pollutants (NESHAP) requirements for radioactive air emissions. CARB also regulates mobile emissions sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. An air quality management district is primarily responsible for regulating stationary emissions sources at facilities within its geographic areas and for preparing the air quality plans that are required under the federal Clean Air Act and California Clean Air Act. The BAAQMD is the regional agency with regulatory authority over emission sources in the Bay Area, which includes all of San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Marin, and Napa counties and the southern half of Sonoma and southwestern half of Solano counties.

Criteria Air Pollutants

Ambient Air Quality Standards

Regulation of criteria air pollutants is achieved through both national and state ambient air quality standards and emissions limits for individual sources. Regulations implementing the federal Clean Air Act and its subsequent amendments established national ambient air quality standards for the six criteria pollutants. California has adopted more stringent state ambient air quality standards for most of the criteria air pollutants. In addition, California has established state ambient air quality standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Because of the unique meteorological conditions in the state, there is considerable diversity between state and national standards currently in effect in California, as shown in Table IV.B-1. The table also summarizes the principal sources for each pollutant.

The ambient air quality standards are intended to protect the public health and welfare, and they incorporate a margin of safety. They are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, including asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

Attainment Status

Under amendments to the federal Clean Air Act, EPA has classified air basins or portions thereof, as either “attainment” or “nonattainment” for each criteria air pollutant, based on whether or not the national standards have been achieved. The California Clean Air Act, which is patterned after the federal Clean Air Act, also requires areas to be designated as “attainment” or “nonattainment” for the state standards. Thus, areas in California have two sets of attainment/nonattainment designations. In addition, an area may be designated “unclassified” for a particular pollutant if there is insufficient information to indicate whether or not the ambient air quality standard for that pollutant is being met. The unclassified status can change if additional monitoring information becomes available to allow a designation to be made.

The Bay Area is currently designated “nonattainment” for state and federal ozone standards (1-hour and 8-hour standards, respectively) and for the state PM-10 and PM-2.5 standards. The Bay Area is “attainment” or “unclassified” with respect to the other ambient air quality standards. Table IV.B-1 also shows the attainment status of the Bay Area with respect to the federal and state ambient air quality standards for different criteria pollutants.

Air Quality Plans

The 1977 Clean Air Act Amendments require that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the Clean Air Act. The 1988 California Clean Air Act also requires development of air quality plans and strategies to meet state air quality standards in areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM standards). Maintenance plans

TABLE IV.B-1
AMBIENT AIR QUALITY STANDARDS AND BAY AREA ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	Bay Area Attainment Status for California Standard	Federal Primary Standard	Bay Area Attainment Status for Federal Standard	Major Pollutant Sources
Ozone	8 Hour 1 Hour	0.07 ppm 0.09 ppm	Unclassified Nonattainment	0.08 ppm ---	Nonattainment ---	Motor vehicles, Other mobile sources, combustion, industrial and commercial processes
Carbon Monoxide	8 Hour 1 Hour	9.0 ppm 20 ppm	Attainment Attainment	9 ppm 35 ppm	Attainment Attainment	Internal combustion engines, primarily gasoline-powered motor vehicles
Nitrogen Dioxide	Annual Average 1 Hour	--- 0.25 ppm	--- Attainment	0.053 ppm ---	Attainment ---	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads
Sulfur Dioxide	Annual Average 24 Hour 1 Hour	--- 0.04 ppm 0.25 ppm	--- Attainment Attainment	0.03 ppm 0.14 ppm ---	Attainment Attainment ---	Fuel combustion, chemical plants, sulfur recovery plants and metal processing
Particulate Matter (PM-10)	Annual Arithmetic Mean 24 Hour	20 μg/m3 50 μg/m3	Nonattainment Nonattainment	50 μg/m3 150 μg/m3	Attainment Unclassified	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
Particulate Matter (PM2.5)	Annual Arithmetic Mean 24 Hour	12 μg/m3 ---	Nonattainment ---	15 μg/m3 65 μg/m3	Attainment Attainment	Same as above
Lead	Calendar Quarter 30-Day Average	--- 1.5 μg/m3	--- Attainment	1.5 μg/m3 ---	Attainment ---	Lead smelters, battery manufacturing & recycling facilities

Note: ppm – parts per million; μg/m3 – micrograms per cubic meter

SOURCE: Bay Area Air Quality Management District, 2005, available at http://www.baaqmd.gov/pln/air_quality/ambient_air_quality.htm are required for attainment areas that had previously been designated nonattainment in order to ensure continued attainment of the standards. Air quality plans developed to meet federal requirements are referred to as State Implementation Plans.

Bay Area plans are prepared with the cooperation of the Metropolitan Transportation Commission, and the Association of Bay Area Governments (ABAG). Currently, there are three plans for the Bay Area. These are:

- The *Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard* (BAAQMD, 2001) developed to meet federal ozone air quality planning requirements;
- The *Bay Area 2005 Ozone Strategy* (BAAQMD, 2006) developed to meet planning requirements related to the state ozone standard; and
- The *1996 Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas*, developed by the air districts with jurisdiction over the ten planning areas including the BAAQMD to ensure continued attainment of the federal carbon monoxide standard. In June 1998, the EPA approved this plan and designated the ten areas as attainment. The maintenance plan was revised in October 1998.

The Bay Area 2001 Ozone Attainment Plan was prepared as a proposed revision to the Bay Area part of California's plan to achieve the federal 1-hour ozone standard. The plan was prepared in response to EPA's partial approval and partial disapproval of the Bay Area's 1999 Ozone Attainment Plan and finding of failure to attain the federal ambient air quality standard for ozone. The revised Ozone Attainment Plan was approved by CARB in 2001 and by EPA in 2003. EPA also made an interim final determination that the plan corrects deficiencies identified in the 1999 plan. However, in April 2004, EPA made a final finding that the Bay Area has attained the federal 1-hour ozone standard. Because of this finding, the previous planning commitments in the 2001 Ozone Attainment Plan for the federal 1-hour ozone standard are no longer required. The region must submit to EPA a redesignation request and a maintenance plan to show that the region will continue to meet the 1-hour ozone standard.

EPA recently transitioned from the federal 1-hour standard to a more health-protective 8-hour standard. In April 2004, EPA designated regions for the new federal 8-hour standard. Defined as "concentration-based," the new federal ozone standard is set at 0.08 parts per million (ppm) averaged over eight hours. The new national 8-hour standard is considered to be more health-protective because it protects against health effects that occur with longer exposure to lower ozone concentrations.

At the same time, EPA designated regions as attainment and nonattainment areas for the 8-hour standard. These designations took effect on June 15, 2004. EPA formally designated the Bay Area as a nonattainment area for the national 8-hour ozone standard, and classified the region as "marginal" according to five classes of nonattainment areas for ozone, which range from marginal to extreme. Marginal nonattainment areas must attain the federal 8-hour ozone standard by June 15, 2007. While certain elements of Phase 1 of the 8-hour implementation rule are still undergoing legal challenge, EPA signed Phase 2 of the 8-hour implementation rule on

November 9, 2005. It is not currently anticipated that marginal areas will be required to prepare attainment demonstrations for the 8-hour standard. Other planning elements may be required. The Bay Area plans to address all requirements of the federal 8-hour standard in subsequent documents.

For state air quality planning purposes, the Bay Area is classified as a *serious* nonattainment area for ozone. The *serious* classification triggers various plan submittal requirements and transportation performance standards. One such requirement is that the Bay Area update the Clean Air Plan every three years to reflect progress in meeting the air quality standards and to incorporate new information regarding the feasibility of control measures and new emission inventory data. The Bay Area's record of progress in implementing previous measures must also be reviewed. On January 4, 2006, the BAAQMD adopted the most recent revision to the Clean Air Plan – the *Bay Area 2005 Ozone Strategy*. The control strategy for the *2005 Ozone Strategy* is to implement all feasible measures on an expeditious schedule in order to reduce emissions of ozone precursors and consequently reduce ozone levels in the Bay Area and reduce transport to downwind regions.

In April 2005, CARB established a new 8-hour average ozone standard of 0.070 parts per million (the same as 70 parts per billion). The new standard took effect in May 2006. CARB is currently working on designations and implementation guidance for the new standard. The one-hour state standard has been retained. The San Francisco Bay Area has not attained the state eight-hour standard, and will be taking action as necessary to address the new standard once the planning requirements have been established.

Toxic Air Contaminants

Non-Radioactive Pollutants

Toxic Air Contaminants (TACs) are regulated at the federal level pursuant to the Clean Air Act, which requires implementation of the National Emission Standards for Hazardous Air Pollutants. A total of 189 such air pollutants are included in the Clean Air Act Amendments of 1990, which revamped the NESHAP program to offer a technology-based approach for reducing the emissions of regulated TACs.

The toxic air contaminants program was implemented in California in 1983 with the passage of the Toxic Air Contaminant Identification and Control Act, better known as the Tanner Bill or AB 1807. The Tanner Bill was amended in 1992 (AB 2728) to include the 189 federal hazardous air pollutants as state TACs.

The California Air Resources Board amended the state TAC list in 1998 by identifying particulate matter emissions from diesel-fueled engines as a TAC. Because the vast majority of diesel exhaust particles are very small by weight (approximately 94 percent of their combined mass consists of particles less than 2.5 micrometers in diameter), both the particles and their coating of TACs can be inhaled into the lungs. EPA has conducted an extensive evaluation of the cancer and non-cancer health effects of diesel exhaust and issued final rules on January 18, 2001, to tighten emission standards for diesel heavy-duty truck engines. The new EPA standards will be fully implemented in 2007. In 2000, the California Air Resources Board developed its comprehensive Diesel Risk Reduction Plan, which calls for a 75-percent reduction in diesel PM by 2010 and an 85-percent reduction by 2020 (from the base year 2000 level). The plan has three major components: first, to require low-sulfur diesel fuel (no more than 15 grams of sulfur per million grams of diesel fuel); second, to develop or implement emission standards for new diesel engines that will reduce PM by 90 percent; and third, to require that existing engines use pollution controls where technically feasible and cost-effective. Between 2001 and May 2004, CARB approved new regulations for five diesel fleets: transit buses, refuse haulers, transportation refrigeration units, stationary engines, and portable engines. Together, these fleets account for about 15 percent of California's diesel PM pollution.

Another major component of California's toxic air contaminants program is AB 2588, or the Air Toxics "Hot Spots" Information and Assessment Act of 1987. AB 2588 currently regulates over 600 air toxics, including all of the Tanner-designated TACs. Under AB 2588, specific facilities, including LBNL, must quantify emissions of regulated air toxic and report them to the local air pollution control districts. If an air pollution control district determines that a given facility poses a potentially significant public health risk, the facility is required to perform a health risk assessment. LBNL has not posed this level of risk. The BAAQMD manages regular updates to AB 2588 reporting requirements through its annual permit renewal program.

The BAAQMD's air permitting program includes a requirement to perform a toxics emission screening analysis on all permit applications. If the BAAQMD concludes that projected emissions of a specific toxic air contaminant from a proposed new or modified source suggest a potential public health risk, then the applicant is subject to a health risk assessment for the source in question. The project must demonstrate acceptable risk levels for the source or the permit may be denied. While the preparation of the 2006 LRDP does not fall under BAAQMD permitting requirements, all future new sources or modifications to existing sources at LBNL are subject to BAAQMD permit review and possible health risk assessment.

The foregoing notwithstanding, a health risk assessment considering activities and sources across the entire facility was prepared for the 2006 LRDP to evaluate potential health risks resulting from emissions of regulated TACs and radioactive pollutants. The health risk assessment results are discussed under Impact AQ-4.

Radioactive Pollutants

The NESHAP regulations promulgated by EPA under the 1990 Clean Air Act Amendments also included control of radionuclide emissions. Subpart H of 40 CFR Part 61 established facilities owned and operated by the Department of Energy (DOE), such as LBNL, as one of the source categories subject to NESHAP regulations. Some DOE facilities emit a wide variety of radionuclides in various physical and chemical states. The purpose of subpart H is to limit radionuclide emissions (not including radon) from the stacks and vents at DOE facilities so that no member of the public receives an effective dose equivalent of more than 10 millirem per year. Subpart H requires emissions sampling, monitoring, and dose calculations to determine compliance with the standard.

LBNL has been in full compliance with subpart H since 1995, when EPA sent DOE written confirmation that LBNL had satisfactorily completed all requirements of a federal facilities compliance agreement. As part of this agreement, LBNL formalized all phases of its NESHAP program and proposed a graded strategy for performing the periodic confirmatory measurements required by the NESHAP regulations. Emissions measurement categories are determined by the greatest potential effective dose equivalent from airborne radionuclide emissions that could be received by a member of the public at an off-site point where there is a residence, school, business, or office. This is called the maximally exposed individual.

Radiochemical and radiobiological studies performed at Berkeley Lab typically use small millicurie quantities of a variety of radionuclides. All use of radioactive material at Berkeley Lab must be in accordance with an LBNL authorization or permit process. A radiation work authorization is issued for long-term projects that operate under routine radiological conditions; a radiation work permit is issued for non-research projects or tasks that require special radiation protection measures. Each authorization or permit is reviewed at least every 18 months, depending on changes to the project. An authorization or permit establishes the location of radioactive material areas (work areas where unsealed radioactive material is handled) and radioactive material storage areas (controlled areas where radioactive material is stored only, with no direct manipulation of the material).

Nanomaterials

Nanoscience is an emerging area of research aimed at the development of structures and devices at the atomic, molecular, or macromolecular levels to produce materials with novel properties and perform functions at the molecular level. EPA has listed nanotechnology as an area for future study under its “Futures Analysis” program, and only recently has EPA begun funding research in this area. No regulatory standards have been developed. Consequently, this topic is not addressed further in this section. The US Department of Energy has issued a secretarial Policy Statement on Nanoscale Safety. This policy statement is included in Appendix G.

BAAQMD Rules and Regulations

The BAAQMD is the regional agency responsible for rulemaking, permitting, and enforcement activities affecting non-radioactive stationary sources. Specific rules and regulations adopted by the BAAQMD limit the emissions that can be generated by various uses and/or activities, and identify specific pollution reduction measures that must be implemented in association with various uses and activities. These rules regulate not only emissions of the six criteria air pollutants, but also emissions of toxic air contaminants and acutely hazardous non-radioactive materials.

Emissions sources subject to these rules are regulated through the BAAQMD’s permitting process and standards of operation. Through this permitting process, including an annual permit review, the BAAQMD monitors generation of stationary emissions and uses this information in developing its air quality plans. Any stationary sources of emissions constructed as part of the LBNL 2006 LRDP would be subject to the BAAQMD *Rules and Regulations*. Both federal and state ozone plans rely heavily upon stationary source control measures set forth in the BAAQMD's *Rules and Regulations*.

LBNL currently has 32 operating permits. These include:

- Epoxy mixing booth located in Building 53;
- Gasoline dispensing facility located near Building 76;
- E85 (85 percent ethanol, 15 percent unleaded gasoline) fuel dispensing facility located near Building 76;
- Soil vapor extraction systems located near Buildings 6 and 58;
- Paint spray booths in Buildings 76 and 77;
- Sandblast exhaust booth in Building 77;
- Sitewide solvent wipe cleaning activities occurring in various buildings; and
- Standby emergency generators (23) supporting various buildings.

The E85 fuel dispensing facility is the newest of the permitted sources, having received its Authority to Construct during the summer of 2003 and having become operational during the spring of 2004. The new E85 facility operates adjacent to the present gasoline dispensing facility. A significant and ever-increasing portion of LBNL's fleet is currently capable of using this alternative fuel.

Stationary source activities must comply with BAAQMD standards of operation regulations. These include shop activities such as sawing, drilling, and milling. Mobile sources of criteria air pollutant emissions (LBNL-related traffic) are exempt from BAAQMD regulations.

The BAAQMD's New Source Review regulations predominantly apply to non-radioactive nonattainment pollutants. The purpose of the New Source Review rule is to provide for the review of new and modified sources and provide mechanisms, including the use of best available control technology for both criteria and toxic air pollutants, and emissions "offsets" (effectively precluding other emissions from occurring) by which authorities to construct such sources could be granted. The New Source Review regulations also include Prevention of Significant Deterioration rules for attainment pollutants, which are designed to ensure that the emission sources will not exceed a specified increase in pollutant concentration or interfere with the attainment or maintenance of ambient air quality standards.

Best available control technologies are required for sources that require an authority to construct or a permit to operate if emissions from a new source or increase in emissions from a modified source would be 10 pounds or more per day of any of a number of organic compounds, nitrogen oxides, sulfur dioxide, particulate matter, or carbon monoxide, or possibly lesser amounts of toxic air contaminants. The BAAQMD's New Source Review regulations require the purchase of emission offsets for any new or modified source that produces a cumulative increase in emissions above a certain level of nitrogen oxides and precursor organic compounds.

Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant polices contained in both the Berkeley and Oakland general plans.

City of Berkeley General Plan

The Environmental Management Element of the City of Berkeley General Plan adopted on April 23, 2002 contains the following objectives and policies related to air quality:

> <u>Objective 3</u>. Reduce emissions and improve air quality.
>
> <u>Policy EM-18: Regional Air Quality Action</u>. Continue working with the Bay Area Air Quality Management District and other regional agencies to:
>
> 1. Improve air quality through pollution prevention methods.
> 2. Ensure enforcement of air emission standards.
> 3. Reduce local and regional traffic (the single largest source of air pollution in the city) and promote public transit.
> 4. Promote regional air pollution prevention plans for business and industry.
> 5. Promote strategies to reduce particulate pollution from residential fireplaces and wood-burning stoves.
> 6. Locate parking appropriately and provide adequate signage to reduce unnecessary "circling" and searching for parking.
>
> <u>Policy EM-19: 15% Emission Reduction: Global Warming Plan</u>. Make efforts to reduce local [air quality] emissions by 15% by the year 2010.
>
> <u>Policy EM-20: City of Berkeley Fleet</u>. The City should exceed Federal and State [air quality] standards for all City fleet vehicles and use all means practical to reduce emissions of criteria pollutants and greenhouse gases.
>
> <u>Policy EM-21: Alternative Fuels</u>. Work with the University of California, the Berkeley Unified School District, and other agencies to establish natural gas fueling and electric vehicle recharging stations accessible to the public.
>
> <u>Policy EM-22: Public Awareness</u>. Increase public awareness of air quality problems, rules, and solutions through use of City publications and networks.

In addition, the following policies in the Berkeley General Plan Transportation Element are applicable to the 2006 LRDP:

Policy T-10 Trip Reduction. To reduce automobile traffic and congestion and increase transit use and alternative modes in Berkeley, support, and when appropriate require, programs to encourage Berkeley citizens and commuters to reduce automobile trips, such as:

2. Participation in the Commuter Check Program.
3. Carpooling and provision of carpool parking and other necessary facilities.
4. Telecommuting programs.
8. Programs to encourage neighborhood-level initiatives to reduce traffic by encouraging residents to combine trips, carpool, telecommute, reduce the number of cars owned, shop locally, and use alternative modes.
9. Programs to reward Berkeley citizens and neighborhoods that can document reduced car use.
10. Limitations on the supply of long-term commuter parking and elimination of subsidies for commuter parking.

Policy T-12 Education and Enforcement. Support, and when possible require, education and enforcement programs to encourage carpooling and alternatives to single-occupant automobile use, reduce speeding, and increase pedestrian, bicyclist, and automobile safety.

Policy T-13 Major Public Institutions. Work with other agencies and institutions, such as the University of California, the Berkeley Unified School District, Vista Community College, the Alameda County Court, and neighboring cities to promote Eco-Pass and to pursue other efforts to reduce automobile trips.

Policy T-19 Air Quality Impacts. Continue to encourage innovative technologies and programs such as clean-fuel, electric, and low-emission cars that reduce the air quality impacts of the automobile.

Policy T-20 Neighborhood Protection and Traffic Calming. Take actions to prevent traffic and parking generated by residential, commercial, industrial or institutional activities from being detrimental to residential areas.

City of Oakland General Plan

The Oakland General Plan Land Use and Transportation Element was approved in March 1998. Policy language is focused on economic development (Industry and Commerce policies), Transportation and Transit-Oriented Development, Downtown, the Waterfront, and the Neighborhoods, as well as Housing; there is limited discussion of institutional uses and employment. The following transportation-related policies are applicable to the 2006 LRDP:

Policy T2.1 Encouraging Transit-Oriented Development. Transit-oriented development should be encouraged at existing and proposed transit nodes, defined by the convergence of two or more modes of public transit such as BART, bus, shuttle service, light rail or electric trolley, ferry, and inter-city or commuter rail.

Policy T2.5 Linking Transportation and Activities. Link transportation facilities and infrastructure improvements to recreational uses, job centers, commercial nodes, and social services (i.e., hospitals, parks, or community centers).

Policy T3.2 Promoting Strategies to Address Congestion. The City should promote and participate in both local and regional strategies to manage traffic supply and demand where unacceptable levels of service exist or are forecast to exist.

Policy T3.5 Including Bikeways and Pedestrian Walks. The City should include bikeways and pedestrian walks in the planning of new, reconstructed, or realigned streets, wherever possible.

Policy T3.6 Encouraging Transit. The City should encourage and promote use of public transit in Oakland by expediting the movement of and access to transit vehicles on designated “transit streets” as shown on the Transportation Plan.

Policy T4.2 Creating Transportation Incentives. Through cooperation with other agencies, the City should create incentives to encourage travelers to use alternative transportation options.

Policy D3.2 Incorporating Parking Facilities. New parking facilities for cars and bicycles should be incorporated into the design of any project in a manner that encourages and promotes safe pedestrian activity.

Policy N1.2 Placing Public Transit Stops. The majority of commercial development should be accessible by public transit. Public transit stops should be placed at strategic locations in Neighborhood Activity Centers and Transit-Oriented Districts to promote browsing and shopping by transit users.

Policy N5.1. Residential areas should be buffered and reinforced from conflicting uses through the establishment of performance-based regulations, the removal of non-conforming uses, and other tools.

The Open Space, Conservation, and Recreation (OSCAR) Element of the City of Oakland General Plan was adopted in 1996. OSCAR Element policies that pertain to natural resources and are relevant to implementation of the LBNL LRDP include the following:

Policy CO-12.1. Promote land use patterns and densities which help improve regional air quality conditions by: (a) minimizing dependence on single passenger autos; (b) promoting projects which minimize quick auto starts and stops, such as live-work development, and office development with ground-floor retail space; (c) separating land uses which are sensitive to pollution from the sources of air pollution; and (d) supporting telecommuting, flexible work hours, and behavioral changes which reduce the percentage of people in Oakland who must drive to work on a daily basis.

Policy CO-12.3. Expand existing transportation systems management and transportation demand management strategies which reduce congestion, vehicle idling, and travel in single-passenger autos.

Policy CO-12.4. Require that development projects be designed in a manner which reduces potential adverse air quality impacts. This may include: (a) the use of vegetation and landscaping to absorb carbon monoxide and to buffer sensitive receptors; (b) the use of low-polluting energy sources and energy conservation measures; (c) designs which encourage transit use and facilitate bicycle pedestrian travel.

Policy CO-12.5. Require new industry to use best available control technology to remove pollutants, including filtering, washing, or electrostatic treatment of emissions.

Policy CO-12.6. Require construction, demolition and grading practices which minimize dust emissions. These practices are currently required by the City and include the following:

- Avoiding earth moving and other major dust-generating activities on windy days.
- Sprinkling unpaved construction areas within water during excavation, using reclaimed water where feasible. (Watering can reduce construction-related dust by 50 percent.)
- Covering stockpiled sand, soil, and other particulates with a tarp to avoid blowing dust.
- Covering trucks hauling dirt and debris to reduce spills. If spills do occur, they should be swept up promptly before materials become airborne.
- Preparing a comprehensive dust control program for major construction in populated areas or adjacent to sensitive uses like hospitals and schools.
- Operating construction and earth-moving equipment, including trucks, to minimize exhaust emissions.

Policy CO-12.7. Coordinate local air quality planning efforts with other agencies, including adjoining cities and counties, and the public agencies responsible for monitoring and improving air quality. Cooperate with regional agencies such as the Bay Area Air Quality Management District (BAAQMD), the Metropolitan Transportation Commission (MTC), the Association of Bay Area Governments (ABAG), and the Alameda County Congestion Management Agency in developing and implementing regional air quality strategies. Continue to work with BAAQMD and the California Air Resources Board in enforcing the provisions of the State and Federal Clean Air Acts, including the monitoring of air pollutants on a regular and on-going basis.

IV.B.2.5 Existing Air Quality

Criteria Air Pollutants

The BAAQMD operates a regional monitoring network that measures the ambient concentrations of the six criteria air pollutants. Existing and probable future levels of air quality in Berkeley and Oakland can generally be inferred from ambient air quality measurements conducted by the BAAQMD at its nearby monitoring stations. There are no BAAQMD monitoring stations in Berkeley. The Alice Street station in Oakland is nearest to the project site (located approximately 4 miles to the south). This station monitors ozone and carbon monoxide. The nearest station that monitors PM-10 is located at Chapel Way in Fremont, approximately 30 miles southeast of the LBNL site. Since particulate matter is a local pollutant, data from the Chapel Way station cannot be considered to be representative of particulate matter concentrations in the project area. Table IV.B-2 shows a five-year summary of monitoring data for ozone and carbon monoxide from the Alice Street station. The table also compares these measured concentrations with state and federal ambient air quality standards. Table IV.B-3 shows trends in regional exceedances of the federal and state ozone standards. Because of the number of exceedances, ozone is the criteria pollutant of greatest concern in the Bay Area. Bay Area counties experience most ozone exceedances during the period from April through October.

TABLE IV.B-2
AIR QUALITY DATA SUMMARY (2001-2005) FOR THE PROJECT AREA

Pollutant	Standard[b]	Monitoring Data by Year 2001	2002	2003	2004	2005
Ozone[a]:						
Highest 1-Hour Average (ppm)[c]		0.07	0.05	0.08	0.08	0.07
Days over State Standard[d]	0.09	0	0	0	0	0
Days over Federal Standard	0.12	0	0	0	0	0
Highest 8-Hour Average (ppm)[c]		0.04	0.04	0.05	0.06	0.05
Days over Federal Standard	0.08	0	0	0	0	0
Carbon Monoxide[a]:						
Highest 1-Hour Average (ppm)[c]		5.0	4.4	3.9	NA	NA
Days over State Standard	20	0	0	0	0	
Days over Federal Standard	35	0	0	0	0	
Highest 8-Hour Average (ppm)[c]		4.0	3.3	2.8	2.6	2.4
Days over State/Federal Standard	9.0	0	0	0	0	0

NA – Not Available

[a] Data are from BAAQMD's Alice Street station in Oakland.
[b] Generally, state standards are not to be exceeded and federal standards are not to be exceeded more than once per year.
[c] ppm – parts per million.

SOURCE: California Air Resources Board, *Summaries of Air Quality Data*, 2001, 2002, 2003, 2004, 2005; http://www.arb.ca.gov/adam.

TABLE IV.B-3
SUMMARY OF OZONE DATA FOR THE SAN FRANCISCO BAY AREA AIR BASIN, 1996–2005

	Number of Days Standard Exceeded[a]			Ozone Concentrations in ppm[b]	
Year	State 1 hr	Federal 1 hr	Federal 8 hr	Maximum 1 hr	Maximum 8 hr
2005	9	0	1	0.12	0090
2004	7	0	0	0.11	0.084
2003	19	1	7	0.13	0.101
2002	16	2	7	0.16	0.106
2001	15	1	7	0.13	0.100
2000	12	3	9	0.15	0.144
1999	20	3	4	0.16	0.122
1998	29	8	16	0.15	0.111
1997	8	0	0	0.11	0.084
1996	34	8	14	0.14	0.112

[a] This table summarizes the data from all of the monitoring stations within the Bay Area.
[b] ppm – parts per million.

SOURCE: California Air Resources Board web site at http://www.arb.ca.gov/adam/cgi-bin/db2www/polltrendsb.d2w/Branch, 2005.

In contrast to some areas of the Bay Area Air Basin, air quality in Berkeley meets clean air standards on most days. While the meteorology is generally favorable for maintaining good air quality, the Berkeley area, along with other portions of the Bay Area that make up the central urban area (i.e., Berkeley-Oakland-San Francisco), is often considered a source region for some pollutants that contribute to elevated concentration levels in downwind communities, such as the Livermore Valley. This is especially the case with mobile or transportation sources.

Motor vehicle transportation, including automobiles, trucks, transit buses, and other modes of transportation, is the major contributor to regional air pollution. Stationary sources were once important contributors to both regional and local pollution. Their role has been substantially reduced in recent decades by pollution control programs. Any further progress in air quality improvement now focuses heavily on transportation sources.

The principal sources of ozone precursors ROG and NOx in the Bay Area include on-road motor vehicles (approximately 39 percent for ROG and 53 percent for NOx), other mobile sources (approximately 17 percent for ROG and 31 percent for NOx), solvent evaporation (approximately 18 percent for ROG), fuel combustion (approximately 11 percent for NOx) and oil and gas production (approximately 8 percent for ROG). Bay Area emissions of the ozone precursors ROG and NOx are expected to decrease by approximately 30 and 44 percent, respectively, between 2004 and 2020 (California Air Resources Board, 2005a) largely as a result of the State's on-road motor vehicle emission control program. The Bay Area has a significant motor vehicle population, and these reductions are projected as vehicles meeting more stringent emission standards enter the fleet and all vehicles use cleaner burning gasoline and diesel fuel or alternative fuels. This includes the use of improved evaporative emission control systems, computerized fuel injection, engine management systems to meet increasingly stringent California emission standards, cleaner gasoline, and the Smog Check program. ROG and NOx emissions from other mobile sources and stationary sources are also projected to decline as more stringent emission standards and control technologies are adopted and implemented.

Table IV.B-2 shows that there have been no exceedances of state and federal ambient carbon monoxide standards at the Alice Street station in Oakland in the last five years. Based on BAAQMD carbon monoxide isopleth maps, projected 2004 background carbon monoxide concentrations in the project vicinity are approximately 5 parts per million, 1-hour average, and 3 parts per million, 8-hour average (BAAQMD, 1999). Currently, on-road motor vehicles are responsible for approximately 70 percent of the carbon monoxide emitted within the San Francisco Bay Area, including Alameda County. Carbon monoxide emissions are expected to decrease within the county by approximately 48 percent between 2004 and 2020 due to attrition of older, high-polluting vehicles, improvements in the overall automobile fleet, and improved fuel mixtures (California Air Resources Board, 2005a).

As explained above, there are no data from a monitoring site that can be considered representative of PM concentration in the project area. Generally, contributors to PM concentrations in the project area are primarily urban sources, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere. Particulate concentrations near residential sources generally are higher during the winter, when more fireplaces are in use and meteorological conditions prevent the dispersion of directly emitted contaminants. Direct PM-10 emissions in Alameda County are expected to increase by approximately 6 percent between 2004 and 2020 (California Air Resources Board, 2005a), primarily from fugitive dust from a projected rise in the vehicle miles traveled as well as stationary sources (such as industrial activities) and area sources (such as construction and demolition, road dust, and other miscellaneous processes). Fugitive dust refers to particulate matter not emitted from a duct, tailpipe, or stack, which becomes airborne due to the forces of wind, man's activity, or both. Activities that generate fugitive dust include vehicle travel over paved and unpaved roads, brake wear, tire wear, soil cultivation, off-road vehicles or any vehicles operating on open fields or dirt roadways, wind erosion of exposed surfaces, and storage piles at construction sites. PM-2.5 emissions in Alameda County are projected to remain steady over the same period (California Air Resources Board, 2005a) as the reduction in emissions from on-road and off-road engines would be offset by an increase in their activity and also an increase in industrial growth.

The standards for nitrogen dioxide, sulfur dioxide, and lead are being met in the Bay Area, and the latest pollutant trends suggest that these standards will not be exceeded in the foreseeable future (BAAQMD, 2001).

Toxic Air Contaminants

San Francisco Bay Area

Both the BAAQMD and CARB have monitoring networks in the Bay Area that measure ambient concentrations of certain non-radioactive toxic air contaminants that are associated with strong health-related effects and are present in appreciable concentrations in the Bay Area. The BAAQMD uses this information to determine risks for a particular area. Generally, ambient concentrations of toxic air contaminants are similar through the urbanized areas of the Bay Area. Of the pollutants for which monitoring data are available, benzene and 1,3- butadiene (which are emitted primarily from motor vehicles) account for over one half of the average calculated cancer risk (BAAQMD, 2004). Benzene levels have declined dramatically since 1996 with the advent of Phase 2 reformulated gasoline. The use of reformulated gasoline also appears to have led to significant decreases in 1,3-butadiene. Due largely to these observed reductions in ambient benzene and 1,3-butadiene levels, the calculated network average cancer risk has dropped significantly in recent years. Based on 2002 ambient monitoring data, the BAAQMD reported a calculated lifetime risk of contracting cancer from measured concentrations of TACs, *excluding* diesel particulate matter, to be 162 in one million averaged over all Bay Area locations (BAAQMD, 2004; p. 3). This is 46 percent less than what was observed in 1995 (BAAQMD, 2004; p. 3). Subsequently released data from the state indicates that the Bay Area lifetime cancer risk from TACs, again excluding diesel particulate, was 111 in one million in 2004 (California Air Resources Board, 2006; p. 237).

Because diesel particulate matter cannot be directly monitored in the ambient air, the BAAQMD uses CARB's estimates of the population-weighted average ambient diesel particulate concentration for the Bay Area to derive an average cancer risk from diesel particulate matter exposure at about 480 in one million, as of 2000 (California Air Resources Board, 2005b). The risk from diesel particulate matter has declined from 750 in one million in 1990 and 570 in one million in 1995 (California Air Resources Board, 2005b).

These calculated average cancer risk values from ambient air exposure in the Bay Area can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which is more than 40 percent, or greater than 400,000 in one million (National Cancer Institute, 2004).

The TAC monitoring stations closest to the LBNL are the Richmond–7th Street Station (1065 7th Street), approximately 7 miles northwest of LBNL, and the Oakland–Davie station (Davie Tennis Stadium, 198 Oak Street), approximately 5 miles south. Table IV.B-4 provides a summary of TAC data for the San Francisco Bay Area Air Basin.

Non-Radioactive Toxic Air Contaminants at LBNL

Many facilities at LBNL are minor sources of regulated air emissions of criteria pollutants or toxic air contaminants. Activities or operations at LBNL that result in TAC emissions include laboratory hood and fume vent emissions, individual boilers for heating and energy operations, standby generators, paint spray booths, and mobile sources that include facility motor pool vehicles and employee shuttle buses.

Radioactive Toxic Air Contaminants

Radiochemical and radiobiological studies performed at LBNL typically use very small (millicurie) quantities of a variety of radionuclides, including carbon-14, hydrogen-3 (tritium),[1] and iodine-125. In addition, radioactive gases are a by-product of charged-particle accelerator operations. Radioactive gases produced by accelerator operations in Buildings 6, 56, and 88 include carbon-11, nitrogen-13, oxygen-15, and fluorine-18. These radioactive gases are considered short-lived radionuclides; flourine-18 has the longest half life, which is less than 2 hours.

Airborne radionuclides could be emitted from any of several locations at LBNL, such as stacks atop buildings. Stack release points vent one or more radioactive material areas where emissions can be measured by sampling or monitoring. Emissions from other release points are controlled by radiation work authorizations or permits and by periodic evaluation; no sampling or monitoring is required.

All radionuclides that are authorized for use or storage at LBNL are considered when determining if emissions from a stack must be measured. As required by 40 CFR Part 61, when making this determination, no credit is taken for emission controls, such as filters and other devices that prevent radionuclides from being emitted into the air. Based on the potential to emit airborne

[1] The Lab has ceased operating the National Tritium Labeling Facility that was formerly operated at the Lab, which resulted in substantial reductions in the already small quantities of tritium used at the Lab. The Lab currently samples for tritium at Buildings 75 and 85, and tritium is authorized for use at various locations around the site.

TABLE IV.B-4
SAN FRANCISCO BAY AREA AIR BASIN TOXIC AIR CONTAMINANTS – ANNUAL AVERAGE CONCENTRATIONS AND HEALTH RISKS

TAC	Annual Average Concentration[a] and Health Risk[b]	2000	2001	2002	2003	2004
Acetaldehyde	Annual Average	0.68	0.73	0.63	0.74	0.74
	Health Risk	3	4	3	4	4
Benzene	Annual Average	0.56	0.43	0.45	0.44	0.37
	Health Risk	52	39	42	41	34
1,3-Butadiene	Annual Average	0.15	0.13	0.14	0.1	0.09
	Health Risk	56	50	51	37	34
Carbon Tetrachloride	Annual Average	0.09	0.09	0.09	0.1	NA
	Health Risk	25	23	24	25	NA
Chromium (Hexavalent)	Annual Average	0.12	--	0.07	0.1	0.09
	Health Risk	18	--	11	14	14
Para-Dichlorobenzene	Annual Average	0.11	0.14	0.15	0.15	0.17
	Health Risk	7	9	10	10	11
Formaldehyde	Annual Average	1.77	2.32	2.57	2.22	1.71
	Health Risk	13	17	19	16	13
Methylene Chloride	Annual Average	0.53	0.27	0.22	0.22	0.14
	Health Risk	2	<1	<1	<1	<1
Perchloroethylene	Annual Average	0.08	0.06	0.05	0.04	0.04
	Health Risk	3	2	2	2	1
Diesel Particulate Matter [c]	Annual Average	1.6	NA	NA	NA	NA
	Health Risk	480	NA	NA	NA	NA
Total Health Risk (without diesel particulate)		179	144	162	149	111
Total Health Risk (with diesel particulate)		649	NA	NA	NA	NA

NA – Not Available

[a] Concentrations for Chromium (Hexavalent) are expressed as nanograms per cubic meter and concentrations for diesel particulate matter are expressed as micrograms per cubic meter. Concentrations for all other TACs are expressed as parts per billion.

[b] Health Risk represents the number of “excess” cancer cases per million people based on a lifetime (70-year) exposure to the annual average concentration; the number of “excess” cases attributed to a particular contaminant is the incremental lifetime increase in cancer cases (or in an individual’s risk of contracting cancer) beyond that resulting from other factors. There may be other significant contaminants other than the ones presented here for which monitoring and/or health risk information are not available.

[c] Diesel particulate matter concentration estimates are based on receptor modeling techniques, and estimates are available only for selected years. Most recent data available are for the year 2000 and have been used for all other years presented.

SOURCE: California Air Resources Board, 2005.

radionuclides, the number and location of monitored and sampled stacks is determined using a EPA-approved NESHAP compliance approach. Table IV.B-5 summarizes the current compliance approach, revised by LBNL and approved by EPA in 2005.

Since November 2002, all Berkeley Lab release points were considered minor sources of radionuclides. That is, the effective dose equivalent from each release point was less than 0.1 millirem per year, which is the threshold limit for minor sources. In June 2005, 13 minor release points that could result in an effective dose equivalent greater than 0.01 millirem per year were sampled or monitored; more than 100 minor release points did not require sampling or monitoring.

TABLE IV.B-5
SUMMARY OF NESHAP COMPLIANCE STRATEGY FOR MEASURING EMISSIONS IN 2005

Annual Effective Dose Equivalent (EDE) millirem/year	Category	Requirements
EDE > 10.0	Non-compliant	Reduction or relocation of source and reevaluation prior to authorization
10 > EDE > 1.0	1	• Continuous sampling with weekly collection and analysis AND • Real-time monitoring with alarming telemetry for short-lived ($t_{1/2}$ < 100 h) radionuclides resulting in > 10% of potential dose to maximally exposed individual
1.0 > EDE > 1.0 x 10^{-1}	2	• Continuous sampling with monthly collection and analysis OR • Real-time monitoring for short-lived ($t_{1/2}$ < 100 h) radionuclides resulting in > 10% of potential dose to maximally exposed individual
1.0 x 10^{-1} > EDE > 1.0 x 10^{-2}	3	Periodic sampling 25% of the year
EDE < 1.0 x 10^{-2}	4	Potential dose evaluation before project starts and when annual radionuclide use limits (as authorized by internal LBL documents) are revised; no sampling or monitoring required

NESHAP – National Emissions Standards for Hazardous Air Pollutants

SOURCE: Radionuclide Air Emission Report for 2005, Lawrence Berkeley National Laboratory, June 2006.

Toxic Air Contaminants and Existing Air Quality

Unlike criteria air pollutants, for which existing air quality is predominantly determined by standardized methods of measuring pollutant concentrations in the ambient environment, air quality related to toxic air contaminants requires an assessment of health risk that is based on either the measured or predicted ambient concentrations of the toxics. The predictive approach is the one most often used because modern computer dispersion models approved by regulatory agencies like EPA are capable of providing representative concentrations for a wide range of toxic substances in the air under various meteorological conditions in a fraction of the time and cost of specialized ambient monitoring of air toxics, if such monitoring methods even exist. The predictive approach can also provide estimated concentrations across a broad region surrounding the source of these emissions rather then the single result represented by monitoring at a specific location. Generally, a health risk assessment reports results that represent the location of maximum risk level.

One outcome of LBNL’s comprehensive human health risk assessment was an upper bound estimate of the risk posed by air emissions from existing sources at LBNL. Designed with assumptions that often erred on highly improbable values, the health risks were estimated for stationary sources such as research laboratories and support operations (e.g., standby generators, paint spray booths), as well as mobile sources such as LBNL’s fleet of on- and off-site shuttle buses. The following paragraphs discuss the maximum health risk modeled for existing conditions.

The maximum off-site (residential and other locations) lifetime risk of developing cancer from existing LBNL air emission sources of non-radionuclide compounds for a hypothetical maximally exposed individual (MEI) who resides 70 uninterrupted years at the same location was estimated at 80 in one million. The location of the MEI was just outside the western LBNL boundary, near where Hearst Avenue becomes Cyclotron Road. Diesel particulate matter contributed 94.5 percent of this risk. Mobile sources accounted for 95 percent of this diesel particulate matter risk, or 90 percent of the total cancer risk. Operation of support equipment such as diesel generators and forklifts contributed 4.5 percent of the risk. Emissions of chemicals from all research laboratories were estimated to contribute less than one percent of the lifetime risk at this location. The maximum on-site lifetime cancer risk for a LBNL employee was calculated at 40 in one million. Both the 80-in-one-million and 40-in-one-million figures may be compared with the California Air Resources Board's estimate of total cancer risk from toxic air contaminants, including diesel particulate matter, of 659 in one million for the Bay Area as a whole (California Air Resources Board, 2006; Table 5-43).[2]

For lifetime cancer risk due to airborne radionuclide emissions, the maximum off-site lifetime risk from existing LBNL sources for the MEI was estimated at 0.3 in one million for a typical resident. For on-site workers, the maximum lifetime cancer risk was also 0.3 in one million.

Another indication of the low risk of LBNL's activities is the calculated effective dose equivalent from airborne radionuclides as required by the NESHAP regulations. In 2005, the calculated dose to the maximally exposed individual (a hypothetical person residing continuously at the Lawrence Hall of Science) from airborne radionuclides was 0.02 millirem. This is 0.2 percent of the annual NESHAP limit of 10 millirem per year from airborne radionuclide emissions.

The NESHAP limit ensures that the maximum estimated risk of cancer incidence for a person living near a facility who is exposed to the emitted pollutant for 70 years is less than 100 in one million. At LBNL, the maximum dose from airborne radionuclide emissions is therefore equivalent to 0.2 in one million.

Evidence that the calculated dose is overestimated is provided by the results of ambient air sampling, which show no increase in airborne radionuclides over those normally found in the ambient air. Results of air emissions measurements at LBNL are published annually in the LBNL site environmental report.[3]

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2 The LBNL-specific cancer risk figures of 80 in one million and 40 in one million would not be additive with the Bay Area-wide risk of 659 in one million (or the areawide risk of 480 in one million from diesel particulate), but would be considered contributing elements to the overall area-wide risk. However, the 659-in-one-million risk represents a population-weighted average for the entire Bay Area; some locations have greater risk and some, lesser.

3 Reports from recent years are available at http://www.lbl.gov/ehs/esg/tableforreports/tableforreports.htm.

The highest Hazard Index for non-cancer health effects for off-site receptors under baseline (existing) conditions from both radionuclide and non-radionuclide compounds was 0.2, well below the 1.0 Hazard Index that is considered an acceptable non-cancer health effects.[4] For on-site (worker) receptors, the highest Hazard Index was also 0.2.

IV.B.2.6 Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. Certain people associated with schools, hospitals and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. People in residential areas are also sensitive to poor air quality because they usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational areas are also considered sensitive locations. Vigorous exercise associated with recreation places a high demand on the human respiratory system and thus leads to greater exposure to ambient air quality conditions.

Sensitive land uses surrounding the project site include residences, open space areas, student dormitories, and day care centers. Because the LBNL site is located within property that is owned by the University of California, it does not generally share unbuffered borders with residential areas, except along its western and northern boundary near Cyclotron Road. North of the central portion of LBNL, located on the slopes above LBNL, are University of California facilities: the Lawrence Hall of Science, the Space Sciences Laboratory, and the Mathematical Sciences Research Institute. Also to the north and northwest of LBNL are residential neighborhoods and a neighborhood commercial area within the City of Berkeley.

Southwest of LBNL is the 180-acre UC Berkeley campus, a public institution operated and maintained by the University of California. Within the campus and in close proximity to LBNL are a dormitory, Foothill Student Housing facility, and a day care facility, which is located in Girton Hall. The area southeast of LBNL, including the open space areas of Strawberry Canyon, is also owned by the University of California.

The land to the east, southeast, and northeast of LBNL receives the primary downwind air patterns; this area consists primarily of open space including the University of California's Ecological Study Area and the Botanical Garden. Northeast of LBNL is the 2,000-acre Tilden Regional Park and to the east is the 205-acre Claremont Canyon Regional Preserve. Along the western boundary of LBNL, the land use in Berkeley is predominantly residential, consisting of

4 The hazard index (for multiple substances) combines the hazard quotient (for single substances). Each hazard quotient is the "ratio of the potential exposure to the substance and the level at which no adverse effects are expected." A hazard quotient of less than 1 indicates no adverse health effects are expected from exposure to a particular substance, while a hazard quotient greater than 1 indicates adverse health effects are possible. Likewise, an aggregated hazard index of less than 1 indicates no likely adverse health effects from exposure to all contaminants analyzed, while a hazard index greater than 1 means that adverse health effects are possible (US EPA, 2006). A hazard index of 1.0 is also considered the threshold of significance in CEQA analysis by the University of California Office of the President, as set forth in the *UC CEQA Handbook*.

single- and multiple-family residential units; the nearest residences there are within about 150 feet of the Laboratory boundary, and within about 400 feet of the nearest Laboratory buildings (Buildings 88 and 90). Other residences, also in Berkeley, are even closer to the Laboratory's northernmost boundary, but somewhat farther from Laboratory buildings. There are single-family residences in the Panoramic Hill neighborhood along the Berkeley-Oakland border, south of the Laboratory. However, these homes are separated from the Laboratory by Strawberry Canyon, and the nearest residences are greater than approximately 1,000 feet distant.

IV.B.3 Impacts and Mitigation Measures

IV.B.3.1 Significance Criteria

For purposes of this EIR, air quality impacts would be considered significant if they would exceed the following Standards of Significance, which are based on Appendix G of the state CEQA Guidelines and the UC CEQA Handbook:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollution concentrations;
- Create objectionable odors affecting a substantial number of people;
- Exceed the probability of 10 in one million of a maximally exposed individual contracting cancer;
- Have ground level concentrations of non-carcinogenic toxic air contaminants that would result in a Hazard Index greater than 1.0 for the maximally exposed individual; or
- Exceed an applicable LRDP EIR or program EIR standard of significance. This criterion is used in situations where the campus may have identified an air quality standard that is different from or exceeds the state standards.

The UC CEQA Handbook states that, where applicable, the significance criteria established by the applicable air district may be used to make these determinations. The handbook recommends that, for an LRDP EIR (as opposed to a project-specific EIR), the analysis of potential air quality impacts should focus on the potential for development pursuant to the LRDP to conflict with or obstruct applicable air quality planning efforts, cause or contribute to a violation of any air quality standard, or expose receptors to substantial air pollutant concentrations of toxic air contaminants or odors.

Thresholds for Criteria Air Pollutants

The *BAAQMD CEQA Guidelines* (BAAQMD, 1999) distinguish between individual development projects and planning documents, such as city and county general plans, specific area plans, and redevelopment plans. The BAAQMD states that the "evaluation of a plan's air quality impacts should focus on the analysis of the plan's consistency with the most recently adopted regional air quality plan" (BAAQMD, 1999; p. 51). For evaluation of operational impacts from individual projects, the BAAQMD recommends a quantitative threshold of 80 pounds per day or 15 tons per year for ROG, NOx, and PM-10. For carbon monoxide, an increase of 550 pounds per day would be considered significant if it led to a possible local violation of the ambient air quality standards.

In accordance with the *BAAQMD CEQA Guidelines* and the UC CEQA Handbook, this EIR judges the significance of the overall impact of the LRDP's operational emissions of criteria air pollutants based on the consistency of the LRDP with the *Bay Area 2005 Ozone Strategy* (BAAQMD, 2006), which is the most recently adopted regional air quality plan. The analysis also estimates total emissions generated by the full implementation of the LRDP, but does not use the comparison of these emissions with the BAAQMD's quantitative significance thresholds as the criterion for determining the significance of the overall impact of the LRDP. (Individual development projects undertaken in the future pursuant to the LRDP would be subject to a significance determination based on the BAAQMD's quantitative thresholds.)

According to the BAAQMD (1999; p. 51), a planning document's consistency with the *2005 Ozone Strategy* is established through a comparison of the plan's projections of population and vehicle use (vehicle miles traveled) with those upon which the *2005 Ozone Strategy* is based; the extent to which the plan implements transportation control measures identified in the *2005 Ozone Strategy*; and whether the plan provides buffer zones around sources of odors and toxics.

This analysis does not address odor impacts, as there is no history of reported odor complaints from LBNL, and the buffer zone around most of the Laboratory's perimeter – between Laboratory buildings and facilities and potential receptors – generally would preclude any exposure of off-site receptors (especially residents) to any odors that could be generated at the Laboratory. Also the proposed uses at the Laboratory pursuant to the LRDP would be similar in overall nature to the existing uses at the Laboratory. Therefore activities pursuant to the LRDP are not expected to generate any odor complaints in the future.

Thresholds for Toxic Air Contaminants

For the analysis of toxic air contaminant impacts, the *BAAQMD CEQA Guidelines* consider a project to have a significant impact if it has the potential to expose sensitive receptors or the general public to toxic air contaminants in excess of the following thresholds:

- Increased probability of developing cancer ("excess cancer risk") for the Maximally Exposed Individual exceeds 10 in a million; or

- Ground level concentrations of non-carcinogenic toxic air contaminants would result in a Hazard Index greater than 1 for the Maximally Exposed Individual.

IV.B.3.2 Impact Assessment Methodology

Air quality impacts resulting from the implementation of the LRDP fall into two categories: short-term impacts due to construction and long-term impacts due to project operation. Construction activities would affect local particulate concentrations primarily due to fugitive dust sources and increase other criteria pollutant emissions from equipment exhaust. Operation of construction equipment would increase emissions of diesel particulate matter, a TAC, which could affect nearby receptors.

Over the long term, the project would result in an increase in criteria pollutant emissions primarily due to related motor vehicle trips. On-site stationary sources and area sources would result in lesser quantities of criteria pollutant emissions. Stationary sources, such as emergency generators, and diesel-fueled mobile sources would generate emissions of toxic air contaminants that could pose a health risk.

The Lab will evaluate whether the air quality impacts of any later activity implemented pursuant to the LRDP were examined in this program EIR before approving the activity as being within the scope of the project covered by the program EIR. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3).

Criteria Air Pollutants Assessment Methodology

For construction-phase impacts, BAAQMD normally does not require quantification of construction emissions, but recommends that the assessment be based on a consideration of the control measures to be implemented (BAAQMD, 1999).

The EIR evaluates the significance of the LRDP's operational emissions of criteria air pollutants at a plan level by determining the consistency of the LRDP with the *Bay Area 2005 Ozone Strategy*. However, operational-phase emissions of criteria pollutants were also quantified using the URBEMIS2002 model and average daily trip estimates from the traffic study for the project.

Toxic Air Contaminants Assessment Methodology

A comprehensive human health risk assessment was completed to evaluate impacts from emissions of toxic air contaminants. It determined the potential impacts of these emissions resulting from expected growth and development of LBNL through 2025 (Golder, 2007). The objective of the health risk assessment was to assess the incremental change in potential health risk to the community from proposed development relative to current baseline conditions. The health risk assessment evaluated emission impacts of toxic air contaminants from both periodic construction activities and ongoing research and associated operations activities**.** The analysis used a detailed emissions inventory strategy and modeled atmospheric dispersion of radioactive and non-radioactive pollutants to characterize potential exposure risk and hazards to the surrounding residential and worker populations. The quantification of LBNL air emissions included all laboratory and support equipment point-source emissions, including both research-related sources such as laboratory fume hoods and support sources such as standby diesel generators, building boilers, and paint spray booths. Also included were emissions from mobile sources associated with LBNL, notably the Laboratory's fleet of diesel buses and other support vehicles. Modeling was conducted using the EPA-approved AERMOD air quality dispersion model (for estimating air inhalation exposure) and CalTOX risk model (for estimating non-inhalation exposures for certain chemicals).

In summary, the process consisted of the following:

1) Identify radionuclide and non-radionuclide chemicals of interest emitted to the air from sources associated with LBNL.

2) Determine appropriate toxicological factors for use in assessing the potential human health risk and hazard for the chemicals of interest.

3) Estimate air emissions of chemicals of interest for emission sources associated with LBNL.

4) Select the radionuclide and non-radionuclide chemicals emitted that account for nearly all of the potential human health risk and hazard based on facility-wide emissions (i.e., identify chemicals of potential concern for the project).

5) Perform dispersion modeling to determine maximum potential ambient concentrations of the chemicals of potential concern.

6) Calculate maximum potential human health risk and hazard due to exposure to chemicals of potential concern emitted from sources associated with LBNL (based on the location-specific dispersion modeling results). A total of more than 800 receptor locations were evaluated, both on- and off-site, based on a grid pattern overlaid on the study area.

The methodology for selecting the chemicals of interest for the risk assessment considered all laboratory and support activities at LBNL. Estimated emissions from these activities were compared against regulatory lists that contained approximately 1,300 chemicals. A systematic screening procedure that considered quantity of emissions and the chemical's toxicity parameters reduced the number of non-radioactive chemicals to 23 and radionuclides to 4 that were then evaluated through the modeling portion of the health risk assessment. These chemicals of potential concern are those that were determined to generate greater than 90 percent of both carcinogenic and non-carcinogenic risk; that is, those chemicals that, based on their toxicity and the volume used at LBNL, account for the overwhelming share of both cancer risk and non-cancer health effects.[5] Table IV.B-6 lists the chemicals of potential concern that were included in the health risk assessment and their estimated baseline annual emission rates.

[5] In the preliminary screening study for the health risk assessment, diesel particulate matter was found to generate more than 95 percent of the overall cancer toxicity of all contaminants evaluated and nearly 30 percent of the overall non-cancer toxicity. In order not to exclude other contaminants (that otherwise would be excluded from the 90-percent threshold), diesel particulate was retained in the study as a chemical of potential concern, but was removed from the screening process to allow a representative mix of other chemicals to compose the 90-percent risk threshold.

TABLE IV.B-6
SELECTED CHEMICALS OF POTENTIAL CONCERN AND BASELINE EMISSION RATE – LBNL HEALTH RISK ASSESSMENT

Non-Radionuclide Chemicals

Chemical	Pounds/Year	Chemical	Pounds/Year
Formaldehyde	175.86	Crotonaldehyde	.7
Carbon Tetrachloride	31.07	Cadmuim	.11
Chloroform	233.9	Boron Trifluoride	3.42
Benzene	109.38	Hydrochloric Acid	260.07
Vinyl Chloride	19.29	Chlorine	28.41
Acetaldehyde	67.70	Diesel Particulate Matter	602.9
Vinylidene Chloride	1.52	7,12 – Dimethylybenz(a)antracene	163E-03
1,3-Butadiene	10.10	Naphthalene	1.95
Acrolein	3.81	Fluoranthene	.27
Ethylene Dichloride	27.26	Benzo(a)pyrene	1.18E-02
Acroylonitrile	1.55	Dibenzo(a,h)anthracene	8.85E-04
Hydrazine	.44		

Radionuclide Chemicals

Chemical	Curies/Year	Chemical	Curies/Year
C-11	4.80E-01	I-125	2.10E-03
F-18	3.40E-01	TH-232	8.65E-07

SOURCE: Golder, 2007.

Both cancer risk and non-cancer health effects from emissions of toxic substances were assessed in the health risk assessment. Consistent with accepted practice, the acceptable maximum lifetime cancer risk from chronic exposure has a probability threshold value of 10 in one million. Accordingly, a project is considered to have a less-than-significant impact in terms of lifetime cancer risk, if the project would result in a maximum increase at any one location of no more than 10 in one million in the risk of contracting cancer during a lifetime of exposure to emissions from the project.[6] For example, if the existing maximum risk of contracting cancer were 50 in one million, and a project were to increase that risk to 57 in one million (i.e., an increase of less than 10 in one million), the project would be considered to result in a less-than-significant impact, whereas if the project were to increase the maximum risk of contracting cancer to 62 in one million (i.e., an increase of more than 10 in one million), the impact would be considered significant.

For cancer risk due to the proposed 2006 LRDP, two comparisons based on the health risk assessment examined projected lifetime risks of contracting cancer, estimated at more than 1,700 on-site and off-site receptor locations. One comparison involved the lifetime risk of contracting cancer due to existing operations of Berkeley Lab versus both the future lifetime risk without implementation of the proposed 2006 LRDP (using assumptions about emissions anticipated to be generated in 2025). The other comparison involved the lifetime risk of contracting cancer due

6 As stated in the Setting, the National Cancer Institute reports that the lifetime probability of being diagnosed with cancer in the United States, from all causes, is more than 40 percent, or greater than 400,000 in one million.

to existing operations of Berkeley Lab versus the future lifetime risk with full implementation of the LRDP. In this way, for each receptor it is possible to determine the "background" change (due to reduced emissions, largely from motor vehicles and stationary engines, that will result from future implementation of existing regulations). It is also possible to determine the separate incremental change due to implementation of the proposed 2006 LRDP. Any increase in lifetime cancer risk of more than 10 in one million at any of the receptors, then, would result in a potentially significant impact.

Potential non-cancer health effects for a series of locations[7] on and off the Laboratory hill site was assessed by use of a "Hazard Index," which is the sum of the ratios of each chemical's hazard quotient. (The hazard quotient is determined for each chemical by comparing the modeled exposure level at a particular receptor location to the acceptable exposure level for that chemical. In other words, a hazard quotient is the fraction of a non-cancer health effects threshold, for a particular contaminant, experienced by a person at a particular location.) Hazard indices are calculated for both long-term (chronic) and short-term (acute) health effects. Consistent with accepted practice, hazard indices less than 1.0 indicate acceptable non-cancer health effects. The UC CEQA Guidelines incorporate both of the above standards (increase of 10 in one million for lifetime cancer risk and 1.0 for hazard index).

Potential chronic exposure to LBNL chemicals of potential concern was assessed based on hypothetical on-site worker and off-site resident receptor types. The on-site worker was assumed to represent an LBNL employee working within the Laboratory boundaries and exposed for 8 hours per day, 245 days per year for 40 years. The off-site resident was assumed to be representative of residents living near LBNL. The assumption for this resident was an exposure for 24 hours per day for 350 days per year for a total of 70 years, which is the extremely conservative standard approach used in human health risk assessments. Alls receptors were assumed to be exposed by the inhalation pathway, as well as by certain non-inhalation pathways due to deposition of air emissions and subsequent exposure via ingestion of the chemicals.

In addition to performing a comprehensive human health risk assessment, LBNL annually assesses the effective dose equivalent from airborne radionuclides, as required by EPA's NESHAP regulations as mentioned earlier.

Like the assumptions used in the comprehensive human health risk assessment, the calculated dose for NESHAP compliance reporting overestimates the actual dose because many conservative factors are used in the calculation. These factors include assumptions about the amounts, types, and forms of radionuclides emitted during the year; the health effects of the emitted radionuclides; the extent to which emissions disperse in the air; the ingestion of vegetables, milk, and beef produced within 50 miles of LBNL; and the maximally exposed individual residing full-time at the Lawrence Hall of Science.

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7 The results of the health risk assessment are location-specific; that is, the potential risk and hazard for each contaminant varies from location to location. In general, the reported results are for the particular locations of maximum risk level for each contaminant or series of contaminants.

Cumulative Impact Assessment Methodology

This EIR section also evaluates whether the implementation of the LBNL 2006 LRDP in conjunction with other reasonably foreseeable projects would result in cumulative significant impacts on air quality, based on traffic forecasts developed from the Alameda County Countywide Travel Demand Model along with trip generation and distribution data developed for the LRDP, as well as the UC Berkeley LRDP, thereby incorporating both regional and LRDP-specific characteristics into the analysis. Cumulative impacts could be significant even if the project's individual impacts are less than significant, as the project impacts could combine with air quality impacts from other projects in the area to cause conflicts with or obstruct implementation of the applicable air quality plan, violate or contribute substantially to an air quality violation, or expose sensitive receptors to substantial pollutant concentrations.

For the assessment of cumulative impacts from increase in criteria air pollutant emissions, this EIR determines the consistency of the 2006 LRDP with the current regional air quality plan.

IV.B.3.3 2006 LRDP Principles, Strategies and LBNL Design Guidelines

2006 LRDP Principles and Strategies

The 2006 LRDP proposes four fundamental principles that form the basis for the development strategies provided for each element of the LRDP. The one principle most applicable to air quality is to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship."

The 2006 LRDP provides strategies intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP (see Chapter III, Project Description for further discussion, and see Appendix B for a full listing of principles, strategies and design guidelines). The strategies set forth in the 2006 LRDP applicable to air quality include the following:

- Protect and enhance the site's natural and visual resources, including native habitats, riparian areas, and mature tree stands by focusing future development primarily within the already developed areas of the site;
- Increase development densities within areas corresponding to existing clusters of development to preserve open space, enhance operational efficiencies and access;
- Site and design new facilities in accordance with University of California Presidential Policy for Green Building Design to reduce energy, water and material consumption and provide improved occupant health, comfort and productivity;
- Increase use of alternate modes of transit through improvements to the Laboratory's shuttle bus service;
- Promote transportation demand management strategies such as vanpools and employee ride share programs;

- Maintain or reduce the percentage of parking spaces relative to the adjusted daily population; and
- Consolidate parking into larger lots and/or parking structures, locate these facilities near Laboratory entrances to reduce traffic within the main site.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LRDP Design Guidelines provide the following specific planning and design guidance relevant to air quality to achieve these design objectives (primarily by encouraging pedestrian travel on the main hill site, with the potential for commensurate reduction in vehicle travel):

- Create new Commons Spaces (central, campus-like collegial spaces creating a focal point and gathering space in each research cluster) in clusters that currently lack them;
- Stimulate pedestrian activity and interaction in the Commons Spaces;
- Create as high a density and critical mass around Commons Spaces as possible;
- Design pathway layouts that support pedestrian flow and encourage casual interaction; and
- Minimize visual and environmental impacts of new parking lots

These objectives can be found in the "B. Research Clusters" and "C. Linkages" sections of the LBNL Design Guidelines.

IV.B.3.4 Impacts and Mitigation Measures

Impact AQ-1: Construction[8] of new facilities proposed under the LBNL 2006 LRDP would generate short-term emissions of fugitive dust and criteria air pollutants that would affect local air quality in the vicinity of construction sites. (Significant; Less than Significant with Mitigation)

Construction activities including demolition would occur intermittently at different sites in the project area throughout the 20-year period over which the project would be implemented. Although the related impacts at any one location would be temporary, construction of individual projects under the proposed project has the potential to cause adverse effects on the local air quality in and around the LBNL area. Construction activities would generate substantial amounts of dust (including PM-10 and PM-2.5) primarily from fugitive sources and lesser amounts of particulate matter and other criteria air pollutants primarily from operation of heavy equipment

8 For the purposes of this EIR, the term "construction," unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

construction machinery (primarily diesel-operated) and construction worker automobiles (primarily gasoline-operated).

Fugitive dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil or other materials being handled, and the prevailing weather. Sources of fugitive dust during construction would include vehicle movement over paved and unpaved surfaces, demolition, excavation, earth movement, grading, and wind erosion from exposed surfaces. In the absence of mitigation, construction activities may result in significant quantities of dust, and as a result, local visibility and particulate matter concentrations may be adversely affected on a temporary and intermittent basis during the construction period. In addition, the fugitive dust generated by construction would include not only PM-10 and PM-2.5, but also larger particles, which would fall out of the atmosphere within several hundred feet of the site and could result in nuisance-type impacts. Demolition of buildings constructed prior to 1980 often involves hazardous materials such as asbestos used in insulation, fire retardants, or building materials (e.g., floor tile, roofing) and lead-based paint. Airborne asbestos fibers and lead dust pose a serious health threat. The demolition, renovation, and removal of lead- and asbestos-containing building materials would be subject to the requirements of BAAQMD Regulation 11, Rules 1 and 2.

The BAAQMD's approach to analyses of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions. The BAAQMD considers any project's construction-related impacts to be less than significant if the required dust-control measures are implemented. With implementation of these measures (detailed in Mitigation Measures AQ-1a and AQ-1b), the impact would be considered less than significant.

Construction activities would also result in the emission of other criteria air pollutants from equipment exhaust, construction-related vehicular activity, and construction worker automobile trips. Emission levels for construction activities would vary depending on the number and type of equipment, duration of use, operation schedules, and the number of construction workers. Criteria pollutant emissions of ROG and NOx from these emission sources would incrementally add to the regional atmospheric loading of ozone precursors during project construction. The *BAAQMD CEQA Guidelines* recognize that construction equipment emits ozone precursors, but indicate that such emissions are included in the emission inventory that is the basis for regional air quality plans. Therefore construction emissions are not expected to impede attainment or maintenance of ozone standards in the Bay Area (BAAQMD, 1999). The impact would therefore be less than significant.

Emissions of toxic air contaminants associated with construction activity are addressed separately under Impact AQ-4.

> **Mitigation Measure AQ-1a:** The BAAQMD's approach to dust abatement calls for "basic" control measures that should be implemented at all construction sites, "enhanced" control measures that should be implemented at construction sites greater than four acres in area, and "optional" control measures that should be implemented on a case-by-case basis

at construction sites that are large in area or are located near sensitive receptors, or that, for any other reason, may warrant additional emissions reductions (BAAQMD, 1999).

During construction of individual projects proposed under the LRDP, LBNL shall require construction contractors to implement the appropriate level of mitigation (as detailed below), based on the size of the construction area, to maintain project construction-related impacts at acceptable levels; this would reduce the potential impact to a less-than-significant level.

Elements of the “basic” dust control program for project components that disturb less than one acre shall include the following at a minimum:

- Water all active construction areas at least twice daily. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water should be used whenever possible.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer).
- Pave, apply water three times daily (or as sufficient to prevent dust from leaving the site), or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily or as appropriate (with water sweepers using reclaimed water if possible) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily or as appropriate (with water sweepers using reclaimed water if possible) if visible soil material is carried onto adjacent public streets.

Elements of the “enhanced” dust abatement program for project components that disturb four or more acres shall include all of the “basic” measures in addition to the following measures:

- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily (or as sufficient to prevent dust from leaving the site), or apply (non-toxic) soil stabilizers to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 miles per hour.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

Elements of the “optional” control measures are strongly encouraged at construction sites that are large in area or located near sensitive receptors, or that for any other reason may warrant additional emissions reductions:

- Install wheel washers for all exiting trucks, or wash off tires or tracks of all trucks and equipment leaving the site.
- Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 miles per hour.
- Limit the area subject to excavation, grading, and other construction activity at any one time.
- Pave all roadways, driveways, sidewalks, etc. as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.
- Designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust off-site. Their duties shall include holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons shall be provided to the BAAQMD prior to the start of construction.

Mitigation Measure AQ-1b: To mitigate equipment exhaust emissions, LBNL shall require its construction contractors to comply with the following measures:

- Construction equipment shall be properly tuned and maintained in accordance with manufacturers' specifications.
- Best management construction practices shall be used to avoid unnecessary emissions (e.g., trucks and vehicles in loading and unloading queues would turn their engines off when not in use).
- Any stationary motor sources such as generators and compressors located within 100 feet of a sensitive receptor shall be equipped with a supplementary exhaust pollution control system as required by the BAAQMD and the California Air Resources Board.
- Incorporate use of low-NOx emitting, low-particulate emitting, or alternatively fueled construction equipment into the construction equipment fleet where feasible, especially when operating near sensitive receptors.
- Reduce construction-worker trips with ride-sharing or alternative modes of transportation.

Significance after Mitigation: Less than significant.

Project Variant. The project variant would not result in any change in building or facility construction, compared to the proposed project, and therefore construction impacts would be as described above. With implementation of mitigation measures AQ-1a and AQ-1b, this impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP will be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to land use and planning. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would affect local air quality in the vicinity of such projects as a result of short-term emissions of fugitive dust and criteria air pollutants. For the reasons stated above with regard to full implementation of the LRDP, this impact would be less than significant with implementation of Mitigation Measures AQ-1a and AQ-1b.

Impact AQ-2: Proposed development under the LBNL 2006 LRDP would generate long-term emissions of criteria air pollutants from increases in traffic and stationary sources. (Less than Significant)

The LBNL 2006 LRDP is a planning document that includes several individual projects anticipated to be developed through 2025. Therefore, the significance of LRDP-generated impacts of criteria air pollutants has been analyzed at a plan level. In accordance with the *BAAQMD CEQA Guidelines*, the air quality impacts are evaluated based on the LRDP's consistency with the current regional air quality plan (i.e., the *Bay Area 2005 Ozone Strategy)*. Operational emissions from the implementation of all projects pursuant to the LRDP have also been quantified. This information is used to determine impacts for specific projects under the LRDP and not the impacts of the LRDP as a whole.

Plan-Level Analysis

The *BAAQMD CEQA Guidelines* direct that a planning document's consistency with the *Bay Area 2005 Ozone Strategy* is established through a comparison of the plan's projections of population and vehicle use with those in the *2005 Ozone Strategy*; the extent to which the plan implements transportation control measures identified in the *2005 Ozone Strategy*; and whether the plan provides buffer zones around sources of odors and toxics.

Consistency with 2005 Ozone Strategy Projections

Consistency with the *Bay Area 2005 Ozone Strategy's* projections is found if the plan's population growth projections would not exceed the comparable projections in ABAG's *Projections 2000*, which contains the population growth projections on which the *2005 Ozone Strategy* is based. Additionally, the rate of increase in vehicle miles traveled must be found to be equal to or less than the growth in population.

Because the 2006 LRDP is a physical land use plan for a research and academic institution (i.e., it has no residential component, unlike a city or county general plan or specific plan), on-site employment growth, rather than residential growth, is the best possible measurement that can be used to compare the LRDP to *Projections 2000*. Thus, employment projections for the City of Berkeley, where the majority of LBNL facilities are located, and, to a lesser extent, the City of Oakland, as provided to ABAG, must include LBNL jobs in order for LBNL employment growth to be included in the *Bay Area 2005 Ozone Strategy*.

Forecasts in *Projections 2000* contained more than enough jobs to accommodate the LRDP's projected increase in adjusted daily population (ADP) and resulting growth in employment; *Projections 2000* assumed an increase in employment in Berkeley of more than 8,000 between the years 2000 and 2020 (the horizon date of *Projections 2000*), with an additional 29,500 jobs forecast in Oakland. Therefore, while job growth at LBNL might result in some redistribution within Berkeley and/or Oakland of employment forecast in *Projections 2000*, the increased employment would be consistent with the job growth on which the *2005 Ozone Strategy* forecasts were based. The LBNL ADP would increase from the current 4,375 to 5,525, or approximately 26 percent.

As to vehicle miles traveled (VMT), almost 40 percent of LBNL employees currently use travel means other than driving alone to commute to work. Assuming no wholesale change in the location of employees in the future, the approximately 26-percent increase in ADP would result in about a 16-percent increase in VMT, which would be less than the rate of ADP growth. Even if some future Laboratory employees lived farther from the Laboratory than do current employees, LBNL's history of encouraging alternative travel modes is likely to keep the VMT increase below the increase in ADP and employment. This is supported by the 2006 LRDP, which allows for no relative increase in the ratio of parking spaces to ADP, meaning that on-site parking would continue to be a limiting factor in driving to work.

Consistency with Bay Area 2005 Ozone Strategy Transportation Control Measures

Consistency with the *Bay Area 2005 Ozone Strategy's* Transportation Control Measures (TCMs)[9] is found if the jurisdiction adopting the plan evidences "reasonable efforts" to implement applicable TCMs. The University's status as both approving jurisdiction and project proponent and employer results in some overlapping responsibility. TCMs identified in the *BAAQMD CEQA Guidelines* as applicable to cities and counties, the jurisdictions generally involved in adoption of planning documents, include the following:

TCM 1 – Support Voluntary Employer-Based Trip Reduction Programs

TCM 9 – Improve Bicycle Access and Facilities

TCM 12 – Improve Arterial Traffic Management

TCM 15 – Local Clean Air Plans, Policies and Programs (focus on site design to reduced single-occupant trips)

9 Transportation Control Measures are strategies and methods to reduce vehicular travel.

TCM 17 – Conduct Demonstration Projects (to reduce emissions, such as implementation of clean fuel vehicle fleets)

TCM 19 – Pedestrian Travel (promote development patterns to encourage walk trips; include pedestrian improvements in capital projects)

TCM 20 – Promote Traffic Calming Measures[10]

LBNL is in a position to implement some of the above TCMs more readily than others. For example, the Laboratory supports trip reduction and pedestrian trips by operating its own shuttle service, including both on- and off-site routes; encourages bike travel by providing bicycle racks on its shuttle buses; has switched its shuttle fleet to "biodiesel" fuel (an alternative to diesel that can be produced from any fat or vegetable oil, including waste cooking oil); and has installed a new fueling station for an alternative fuel (85 percent ethanol and 15 percent gasoline). In addition, one of the objectives of the 2006 LRDP is to "Clarify and strengthen existing pedestrian and vehicular circulation to enhance way-finding and promote safety." Inasmuch as the Laboratory controls only roadways within its fence line, it is not especially able to effect changes in arterial traffic management (TCM 12) or traffic calming (TCM 20).

Other TCMs are applicable to employers and include the following:

TCM 13 – Transit Use Incentives (such as provision of Commuter Checks to employees)

TCM 14 – Improve Rideshare/Vanpool Services and Incentives

TCM 16 – Intermittent Control Measure/Public Education (participation in the BAAQMD's "Spare the Air" campaign to reduce driving on smoggy days)

TCM 18 – Transportation Pricing Reform (including providing a cash payment in lieu of parking to employees who do not drive to work)

LBNL currently offers and would continue to offer, under the LRDP, financial incentives for alternatives to driving alone, both in the form of pre-tax payments, for either transit passes or for vanpool expenses. The Laboratory also participates in Alameda County's Guaranteed Ride Home program, under which employees who ride transit or carpool to work can obtain a ride home in the event of an emergency or if they miss their carpool. LBNL promotes the BAAQMD's Spare the Air program by annually notifying Laboratory employees of its program through the Laboratory's electronic newsletter. Finally, LBNL encourages carpooling by providing links on its website to the Metropolitan Transportation Commission carpool-matching program.

Under the 2006 LRDP, Berkeley Lab would continue to seek opportunities to implement new or expand existing TCMs. The Laboratory has developed a draft TDM Program that specifically addresses a number of the TCMs, with trip reduction strategies that would be promoted during the 2006 LRDP planning period. The draft TDM Program is included in Appendix F of this EIR.

[10] The BAAQMD 2004 Ozone Strategy table of draft control measures (viewed May 13, 2005, at http://www.baaqmd.gov/pln/plans/ozone/2003_workgroup/cmsummarytables.pdf) notes, however, that "Traffic calming is an important support program for other TCMs, particularly bike/ped programs, but it is uncertain how much additional emission reductions can be attributed specifically to traffic calming projects."

Impacts Associated with Odors and Toxics

To be consistent with the *2005 Ozone Strategy*, a plan should provide for buffer zones around potential sources of odors and/or toxic air contaminants. As noted under "Significance Criteria" above, LBNL has no history of odor complaints and does, in fact, provide an extensive buffer zone around most of the Laboratory's perimeter. In the northwest corner of LBNL, the only area of LBNL not separated by an extensive buffer zone from nearby residences, sensitive receptors are upwind from LBNL facilities during generally prevailing westerly and northwesterly winds, thereby further reducing any potential for odor impacts.

It is noted that this same buffer zone serves to separate potential receptors from toxic air contaminant emissions at LBNL. Potential impacts related to toxic air contaminants are discussed in detail below, under Impact AIR-4.

Conclusion

In summary, the 2006 LRDP would be consistent with the *Bay Area 2005 Ozone Strategy* because it would not result in employment in excess of the *2005 Ozone Strategy's* projections and would not result in a VMT increase greater than the increase in Laboratory employment; the LRDP would implement transportation control measures identified in the *2005 Ozone Strategy*; and the LRDP would provide appropriate buffer zones around sources of odors and toxics. Therefore, emissions of criteria air pollutants resulting from development pursuant to the LRDP would not be significant.

Project-Level Analysis

Table IV.B-7 presents estimated emissions of criteria pollutants due to implementation of the LRDP. The estimates include criteria pollutant emissions from all projects proposed under the LRDP. The table also provides BAAQMD's project-level thresholds of significance.

TABLE IV.B-7
OPERATIONAL EMISSIONS (pounds per day)

Pollutant	BAAQMD Thresholds	Vehicular Emissions[a]	Stationary-Source Emissions
Reactive Organic Gases (ROG)	80	37.2	0.5
Nitrogen Oxides (NOx)	80	39.7	5.3
Particulate Matter (PM-10)	80	32.2	<0.1
Carbon Monoxide (CO)	550	381.3	2.7

BAAQMD – Bay Area Air Quality Management District

[a] Emission factors were generated by the Air Board's URBEMIS2002 model for San Francisco Bay Air Basin, and assume a default vehicle mix. Input assumptions include an ambient summer temperature of 75 degrees, winter temperature of 50 degrees and year 2005 EMFAC2002 composite emissions factors (which overstate emissions, because development under the LRDP would continue through 2025). Emissions are based on 1,600 new vehicle trips per day, using 1,200 employees at 1.33 daily vehicle trips per employee and the "Industrial Park" land use designation in URBEMIS2002. All daily estimates are for summertime conditions except for CO, which assumes wintertime conditions. Stationary-source emissions are for summer.

SOURCE: Environmental Science Associates, 2004.

Table IV.B-7 shows that criteria pollutant emissions from the LRDP as a whole (i.e., at full implementation) would not exceed any of the BAAQMD-recommended project-level significance thresholds.[11] Therefore, no individual project proposed under the LRDP would exceed the significance thresholds. Therefore, the impact of individual projects developed pursuant to the LRDP, as determined by the BAAQMD-recommended methodology for evaluation of project impacts, would be less than significant.

Mitigation: None required.

Project Variant. The project variant would add about nine percent more LBNL traffic to the streets of Berkeley, assuming that all 350 of the employees shifted from the downtown facility to the Lab hill site would drive. Because some or all of these employees currently drive to the downtown location, however, the change in regional emissions of criteria air pollutants would be negligible, and thus the analysis presented above would be applicable to the variant as well.

Individual Future Projects/ Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP will be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is included in the scenario might be constructed pursuant to the 2006 LRDP, but the overall amount of construction will be limited to the amount of new construction proposed in the LRDP. Thus the scenario remains an appropriate and conservative basis for the evaluation of the impacts of potential individual projects under the LRDP. Potential individual projects under the 2006 LRDP such as those included in the Illustrative Development Scenario would create operational emissions of criteria air pollutants no greater than those estimated in Table IV.B-7 for all projects proposed under the LRDP. For the reasons stated above, the impact of these emissions would be less than significant.

Impact AQ-3: Proposed development under the LBNL 2006 LRDP would increase carbon monoxide concentrations at busy intersections and congested roadways in the project vicinity. (Less than Significant)

Traffic generated by the project would have the potential to affect carbon monoxide concentrations along surface streets. This increase in traffic would add more vehicles on the road and the increased congestion would cause existing non-project traffic to travel at slower, more polluting speeds. However, carbon monoxide levels have been declining for many years and roadside exceedances of state and federal 1-hour and 8-hour standards are seldom encountered any longer. Worst-case carbon monoxide concentrations in the vicinity of local streets, (e.g., at

[11] This finding also supports an alternative determination, on a plan level, that the LRDP in toto would not result in a significant impact with regard to criteria air pollutants.

the heavily trafficked intersections of San Pablo and University avenues and at University and Shattuck avenues) are well below the state and federal ambient air quality standards.[12]

Development pursuant to the 2006 LRDP would add, at most, 9 percent to the traffic volume at any of the study intersections, with the only exception being the intersections closest to the Laboratory's entrance gates. For example, at Hearst and LeRoy avenues, leading to Cyclotron Road and the Laboratory's main Blackberry Canyon Gate, project traffic would add 7.9 percent to projected future volumes in the afternoon peak hour, and 8.6 percent to (slightly lower) projected future volumes in the morning peak hour. The resulting total volumes, however, would be such that carbon monoxide levels would remain well below state and federal ambient air quality standards. At more heavily traveled intersections, such as Hearst Avenue and Oxford Street, the project's increment would be far less (i.e., approximately 2 percent) and again, resulting total volumes are projected to keep carbon monoxide levels well below state and federal ambient air quality standards.

Further supporting this conclusion, background carbon monoxide levels are projected by CARB to be significantly lower in 2025. The projected lower levels are derived from the CARB emissions model EMFAC2002, and they reflect the phasing out of older, dirtier autos in future years. Despite the addition of project and cumulative traffic, carbon monoxide concentrations at the intersections are expected to decrease over the LRDP implementation period through 2025. Therefore, the long-term increase in project and cumulative traffic would not violate any air quality standard or contribute to an existing or projected air quality violation in the project vicinity. Thus the impact on local carbon monoxide concentrations would be less than significant.

Mitigation: None required.

Project Variant. The project variant would add about nine percent more LBNL traffic to the streets of Berkeley, assuming that all 350 of the employees shifted from the downtown facility to the Lab hill site would drive. Because some or all of these employees currently drive to the downtown location, however, only project study intersections east of Shattuck Avenue would be affected. However, the potential increase in traffic volumes at these intersections would not be sufficient to result in violations of state or federal carbon monoxide standards because, as noted above, carbon monoxide concentrations under the project conditions would be well below the applicable standards.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP will be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is included in the scenario might be constructed pursuant to

[12] The estimates correspond to a hypothetical location approximately 7 feet from the roadway. These estimates also include background 1-hour-average concentrations of 7.5 parts per million (ppm) and background 8-hour average concentrations of 4.5 ppm in 2005.

the 2006 LRDP, but the overall amount of construction will be limited to the amount of new construction proposed in the LRDP. Thus the scenario remains an appropriate and conservative basis for the evaluation of the carbon monoxide impacts of potential individual projects under the LRDP. Potential individual projects under the LRDP such as those included in the Illustrative Development Scenario would increase carbon monoxide concentrations at busy intersections and congested roadways in the project vicinity, but for the reasons stated above regarding full implementation of the LRDP, the impact would be less than significant.

Impact AQ-4: Implementation of the proposed 2006 LRDP would expose people to toxic air contaminants. (Significant; Less than Significant with Mitigation)

A human health risk assessment was prepared to identify risks resulting from the implementation of the LRDP (Golder, 2007). The health risk assessment examined total lifetime excess risk results to typical on-site workers and off-site residents from development during the LRDP period as well as existing LBNL operations at the start of the LRDP period and the potential cumulative risk from other contributing sources in the vicinity of LBNL.

The health risk assessment was based on the LRDP as originally proposed in the Notice of Preparation, and does not reflect the reduction in scope of the LRDP in response to comments from the City of Berkeley. Such health risk assessments are by their nature highly conservative in their analysis, using assumptions about exposure that tend to significantly overstate the actual pattern of human exposure (for example, it is standard methodology for health risk assessments to assume that a maximally exposure individual remains at the same location for 70 years and during that time is outdoors 24 hours each day). Given that health risk assessments are inherently conservative analyses that tend to overstate risk, it is also appropriate to continue to use the health risk assessment for the LRDP as originally proposed, even though the actual level of potential development under the LRDP is substantially reduced.

Operation – Cancer Risk from Non-Radionuclide Emissions

There are two criteria that can be used from the health risk assessment to assess the degree to which implementation of the 2006 LRDP would expose people to toxic air contaminants. These two criteria are the level of exposure to toxic air contaminants faced by a theoretical maximally exposed individual, and the area which is subject to increases in modeled health risk over the standard accepted threshold of 10 in one million. As explained below, the health risk assessment indicates that the vast majority of health risk attributable to both current and proposed operations of the Lab is attributable to diesel particulate matter. The health risk assessment indicates that, in general, both the risk to the maximally exposed individual will decrease and the area subject to existing modeled exceedances of the health risk threshold will significantly shrink in the future (largely due to improvements in diesel particulate emissions control). Furthermore, the reduction in the area subject to excess health risk would occur with or without implementation of the proposed 2006 LRDP. In fact, the health risk assessment shows that implementation of the 2006 LRDP would slightly reduce health risk when compared to the no-project scenario. While these decreases in future health risk are projected, the assessment also indicated that on a receptor-by-receptor comparison, there is a small area where the incremental risk will increase.

Off-Site Receptors

With full implementation of the 2006 LRDP in 2025, of the 849 locations modeled in the health risk assessment as potential off-site receptors, not a single receptor returned an increase in cancer risk in excess of 10 in one million, either in comparing future with-project risk to future no-project risk, or in comparing future with-project risk to existing risk. In comparing future no-project conditions to conditions with implementation of the 2006 LRDP, the risk increased at about one-half of the receptors and decreased at the other half. The maximum increase was 8 in one million, and the risk increased by more than 5 in one million at only 3 of 849 off-site receptors, none of which are in residential areas.[13] Comparing existing to future with-project conditions, the risk decreased at 61 percent of receptors, and increased at 39 percent. Because of improvements in emissions quality anticipated due to regulations already in place (primarily targeting diesel particulate matter), no increase in risk was greater than 3 in one million. Additionally, the geographic area exposed to a lifetime cancer risk of 10 in one million or more would decrease in the future, under both no-project and with-project conditions, compared to existing conditions.

Supporting the incremental risk analysis above, the maximum off-site lifetime cancer risk, for a hypothetical 70-year resident, from LBNL sources of non-radionuclide compounds for the hypothetical maximally exposed individual (MEI) is estimated to be 50 in one million, assuming full implementation of the 2006 LRDP. This risk value compares to 80 in one million under existing LBNL operations. The location of the estimated MEI for the project scenario is just outside the LBNL northern fence line, in a non-residential area near the Lawrence Hall of Science.[14] As under existing conditions, diesel particulate matter would again contribute the vast majority of the risk to the MEI – 94.6 percent compared to 94.5 percent under existing conditions. However, of that 94.6 percent, diesel particulate matter from mobile sources would contribute less than 7.3 percent of the risk in this scenario. This minimal contribution rate is due to assumed reductions in mobile diesel emissions relative to stationary sources, and the fact that a proposed new diesel generator may be installed near the MEI receptor location. Stationary sources, including routine testing of diesel generators and operation of equipment such as forklifts, would contribute more than 87 percent of the lifetime cancer risk at this location. Laboratory chemicals and other stationary source chemical emissions would contribute less than 5 percent of the lifetime risk at this location.

For reasons stated above, the impact of non-radionuclide emissions on off-site receptors is determined to be less than significant.

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13 The three off-site receptors with the greatest increase in risk are just outside the Strawberry Canyon gate to the Lab. Therefore, no residential receptor would experience an increase in lifetime cancer risk in excess of 5 in one million.

14 For the location just outside the west LBNL boundary, in the vicinity of UC Berkeley's Foothill Student Housing, where the MEI was located under existing conditions, the lifetime cancer risk would also decline from 80 in one million to 50 in one million.

On-Site Receptors

A total of 879 on-site locations were modeled as potential receptors. In comparing both existing and future no-project conditions to future conditions due to implementation of the 2006 LRDP only one receptor, located in the northwest portion of LBNL, near Building 90, resulted in an increase in lifetime cancer risk in excess of 10 in one million, which would result in a significant impact. The increase was 20 in one million. Further investigation revealed that this increase in risk at this location was the result of the interaction between the exhaust flow from an existing emergency (standby) generator and the change in air currents that would result from the construction of a specific building identified in the Illustrative Development Scenario, Parking Structure PS-1 (see Figure III-9 in Chapter III, Project Description.)[15] This, and all other diesel generators greater than 50 horsepower, are permitted by BAAQMD for a certain number of hours of operation for maintenance and testing purposes. This permitted level was the number of hours modeled in the health risk assessment.

Subsequent modeling related to the health risk assessment revealed that the significant risk impact at this on receptor could be avoided by changing the configuration of the exhaust stack from this generator. Because the existing generator exhaust is fitted with a fixed rain cap to prevent precipitation and foreign objects from entering the stack, the free flow of exhaust is obstructed when the generator is in operation. In fact, for modeling purposes, the exit velocity from such stacks was assumed to be essentially zero (i.e., 0.01 meters per second). However, removal of the rain cap or its replacement with a hinged cap, which would allow free upward exhaust flow, would reduce the lifetime cancer risk at the receptor location by a factor of 300 (i.e., from 60 in one million to 0.2 in one million), which would avoid any possibility of an increase—due to the project—exceeding 10 in one million.

None of the other on-site receptors registered an increase in lifetime cancer risk in excess of 10 in one million; the greatest value was 9 in one million (when comparing both existing and future no-project conditions to future conditions with implementation of the 2006 LRDP), and only three receptors (in both comparisons) recorded increases of more than 5 in one million. The maximum on-site lifetime cancer risk for a Laboratory employee was calculated at 60 in one million, somewhat higher than under existing conditions. However, this risk would arise in a very localized area due to change in building downwash effects near the existing generator discussed above, and the risk at the second-highest on-site receptor location would be 40 in one million, similar to the maximum value under existing conditions.

Because of the single location where the lifetime cancer risk would increase by more than 10 in one million, the impact of non-radionuclide emissions on on-site (worker) receptors is determined to be significant. However, implementation of Mitigation Measure AQ-4a, below, would reduce the impact to a less-than-significant level.

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[15] As stated in the Project Description, Chapter III, one of the purposes in the Lab developing the Illustrative Development Scenario was to “provide a basis for such quantified or modeled studies as the human health risk assessment and visual simulations.”

In reviewing toxic air contaminant issues as measured by the health risk assessment, it is important to note the highly conservative or “overly cautious” nature of the analysis. The health risk assessment is a modeled risk assessment based on assumptions that are very conservative, and ensure that the assessment does not underestimate risk. Those assumptions include the supposition that an individual spends a 70-year lifetime at the modeled locations, and (for off-site resident receptors) that an individual consumes some food, such as homegrown fruits and vegetables, produced at that location. While this type of modeling may overestimate health risk, it is standard accepted practice in health risk assessment and is used here for that reason.

Operation – Cancer Risk from Radionuclide Emissions

Off-Site Receptors

For lifetime cancer risk due to radionuclide emissions after implementation of the 2006 LRDP, the maximum off-site (residential and other locations) lifetime risk from LBNL source emissions for the MEI was estimated to be 0.4 in one million for a “typical” resident, compared to 0.3 in one million under existing conditions. The projected slight increase in risk to the MEI is attributable to several proposed research buildings for the southeastern area of the Laboratory. The close proximity of these new buildings to the facility property line is a main reason behind the slightly higher risk value. It is worth noting that this projected MEI is on UC land around the Botanical Gardens that is unlikely to be developed for residential use during the LRDP period. In fact, there is a slight additional reduction in health risk with implementation of the 2006 LRDP. Moreover, with a maximum risk of 0.4 in one million, there would be no location where the increase in risk due to the project would exceed 10 in one million, and the impact would be less than significant.

For a “self-sufficient” resident (i.e., a person who consumes food produced at home, such as home-grown fruits and vegetables) the lifetime cancer risk from radionuclides under the LRDP at full implementation was calculated at 40 in one million, the same as under existing conditions.

The health risk impact from radionuclide emissions is considered less than significant, for two reasons. First, and most importantly, as described above, the health risk estimated at full implementation of the LRDP is substantially the same as under existing conditions. Further, even though the modeled risk shows an exceedance of the commonly applied 10-in-one-million threshold (under existing conditions as well as under the LRDP at full implementation) for the self-sufficient resident scenario, that self-sufficient resident scenario is, for purposes of CEQA analysis, speculative and not reasonably foreseeable. It assumes a lifetime at the same site, with all consumed fruits and vegetables being home-grown or locally produced. Modeling with those types of assumptions, while standard practice in health risk assessments, does not represent a reasonably foreseeable basis for impact evaluation. Furthermore, the risk to the speculative self-sufficient resident attributable to the LRDP itself, i.e., not including that attributable to existing sources, is far below the 10-in-one-million threshold, given that there is no difference between the risk under existing conditions and at full implementation of the LRDP (including the contribution of existing sources).

On-Site Receptors

For on-site workers, the maximum lifetime cancer risk was 0.3 in one million, also the same as under existing conditions. Thus, implementation of the LRDP would result in an increase in risk of far less than 10 in one million, and the impact would be less than significant.

Operation – Non-Cancer Effects

The highest Hazard Index projected for chronic non-cancer health effects at off-site (residential and other locations) receptors under the LRDP development assumptions was 0.1, compared to 0.2 under existing conditions. The same comparison for on-site receptors estimates the project's highest Hazard Index at 0.2, the same as under existing conditions. Thus, with implementation of the LRDP, both off-site and on-site hazard indices due to chronic exposure would be well below the 1.0 Hazard Index that is considered an acceptable non-cancer health effects at all receptor locations, and the effect would be less than significant.

Construction/Demolition

Dispersion modeling based on estimated diesel particulate emissions from construction and demolition activities anticipated as part of the proposed LRDP resulted in maximum annual average ambient concentrations of 0.14 micrograms per cubic meter for off-site receptors and 0.45 micrograms per cubic meter for on-site receptors. These concentrations, along with exposure assumptions applicable to the nature and duration of the construction/demolition activities, provide estimates of maximum cancer risk of 20 in one million for off-site receptors and 10 in one million for on-site receptors. The only off-site receptor locations that would exceed the 10 in one million significance standard are right on the LBNL property boundary next to a potential demolition/construction project conceptually portrayed in the Illustrative Development Scenario and therefore factored into the health risk assessment. There are no residences currently existing at or near this location. In addition, the risk actually associated with the LRDP is less than 10 in one million. Therefore, with no active receptor at the location of greatest off-site risk, the effect would be less than significant.

Corresponding maximum chronic non-cancer hazard indices were less than 0.1 for off-site receptors and 0.1 for on-site receptors. Both hazard indices would be well below the 1.0 Hazard Index that is considered an acceptable non-cancer health effect. Therefore, the effect would be less than significant.

Conclusions

The results of the human health risk assessment indicate that cancer risk and non-cancer hazard for off-site receptors, including residential receptors, resulting from air emissions from LBNL emission sources would not be significant relative to generally accepted regulatory thresholds. The majority of the risk and hazard are, and will continue to be, due to emissions of diesel particulate matter, which is a ubiquitous pollutant in the Berkeley and greater Bay Area. Furthermore, LBNL has already taken steps to help reduce diesel particulate emissions from the Laboratory, including use of a bio-diesel fuel in diesel combustion sources (mobile and stationary) and the addition of control devices (i.e., catalytic oxidation units, diesel particulate filers) on new emergency back-up electrical generators, both of which reduce emissions of diesel particulate matter and other toxic pollutants. Further, the area subject to the modeled exceedance of health risk will decrease substantially in the future, and this decrease will occur with or without the project. For on-site (worker) receptors, one location was identified where the increase in lifetime cancer risk would exceed the 10-in-one-million threshold, resulting in a significant impact. Implementation of Mitigation Measure AQ-4a, below, would reduce the impact to a less-than-significant level. The impact of non-cancer hazard to on-site receptors would be less than significant.

> **Mitigation Measure AQ-4a:** To avoid the single location where implementation of the 2006 LRDP would result in an increase in health risk in excess of the 10-in-one-million threshold, LBNL shall adjust, prior to the construction of parking structure PS-1 (or similarly configured building), the exhaust system of the existing generator near Building 90 to reduce or eliminate the restriction on upward exhaust flow caused by the existing rain cap. For example, modeling indicates that removal of the rain cap would reduce the risk caused by construction of parking structure PS-1 in proximity to the existing generator to a level below 10 in one million. The Lab could install a hinged rain cap, which would prevent moisture infiltration into the generator but still allow unobstructed exhaust flow and would avoid the significant impact identified in the health risk assessment.
>
> **Significance after Mitigation:** Less than significant.

Project Variant. The project variant would add about nine percent more LBNL traffic to the streets of Berkeley, assuming that all 350 of the employees shifted from the downtown facility to the Lab hill site would drive. Because the variant would not substantially change the layout of development or the nature of uses of facilities on the Lab hill site, it would not be expected to substantially alter the conclusions of the health risk assessment presented above.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. The scenario is intended to provide a conservative basis for the analysis of environmental impacts, and the scenario was the basis for the modeling used in the health risk assessment. Actual overall development that is approved and constructed pursuant to the 2006 LRDP will be less intense than portrayed in the scenario. The scenario was developed before the proposed 2006 LRDP was reduced and scoped in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Given the standard practice of using conservative assumptions in evaluating health risk, however, the scenario remains an appropriate and conservative basis for evaluating the potential air quality impacts and human health risks of the proposed 2006 LRDP. Given that the scenario is an overall assessment of development, any potential individual project under the LRDP such as those included in the Illustrative Development Scenario would generate risks from exposure of people to toxic air contaminants lower than those associated with implementation of the 2006 LRDP, and this impact would therefore, similar to the impact from implementation of the 2006 LRDP, be less than significant, with implementation of Mitigation Measure AQ-4a, as described above.

IV.B.3.5 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex – housing the Bevatron accelerator – although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Additional projects currently underway at UC Berkeley, described in Section VI.C, Cumulative Impacts, of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis is the Bay Area Air Basin. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.B-24) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact AQ-5: The project, together with anticipated future cumulative development in Berkeley and the Bay Area in general, would contribute to regional increases in criteria air pollutants. (Less than Significant)

As discussed under Impact AQ-2, the 2006 LRDP would be consistent with the *Bay Area 2005 Ozone Strategy* because it would not result in employment in excess of the *2005 Ozone Strategy's* projections and would not result in a VMT percentage increase greater than the percentage increase in Laboratory employment; the LRDP would implement transportation control measures identified in the *2005 Ozone Strategy*; and the LRDP would provide appropriate buffer zones around sources of odors and toxics. Further, the emissions of criteria pollutant emissions from the implementation of the entire LRDP would be less than the BAAQMD recommended significance thresholds for individual projects.

Stationary, mobile and area sources associated with the development of the Lab's hill site, together with similar sources associated with growth at UC Berkeley[16] and in the cities of Berkeley and Oakland, and regional growth throughout the Bay Area air basin, would contribute to emissions of criteria pollutants for which the region is in nonattainment status and could hinder attainment efforts. As discussed under Impact AQ-2, however, the LRDP would not directly result in any increase in population to the region and the increased employment generated under the LRDP would be consistent with the job growth on which the *2005 Ozone Strategy* forecasts were based. Therefore, while cumulative emissions from regional growth might result in a significant impact on air quality, the proposed project's contribution to this cumulative impact would not be "cumulatively considerable." Therefore, development pursuant to the LRDP would

[16] The Draft EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) found that those projects would not result in any adverse impacts related to hazards or hazardous materials, and thus the SCIP would not contribute to any cumulative impacts (UC Berkeley, 2006).

not contribute considerably to cumulative increases in criteria air pollutants, and the cumulative effect would be less than significant.

Mitigation: None required.

Project Variant. The project variant's contribution to regional increases in criteria air pollutants would be substantially similar to the contribution to regional increases in criteria air pollutants from the 2006 LRDP development. Thus, development pursuant to the project variant would not contribute considerably to cumulative increases in criteria air pollutants, and the cumulative effect would be less than significant.

Individual Future Project/Illustrative Development Scenario. A future project identified in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development, would also, for the reasons stated above, result in cumulative impacts related to increases in criteria air pollutants that would be less than significant.

Impact AQ-6: Even though cumulative emissions of toxic air contaminants would decrease, implementation of the LBNL 2006 LRDP, in combination with other potential contributing projects, would contribute to cumulative emissions of toxic air contaminants that result in an excess cancer risk that exceeds, and would continue to exceed, 10 in one million. (Significant and Unavoidable)

The following discussion of cumulative emissions of toxic air contaminants evaluates this cumulative impact both in terms of regional exposure levels as determined by state and local air quality agencies, and also by considering the combination of development pursuant to the LRDP with other development proposed in the vicinity.

First, the other major project in the vicinity of LBNL identified for this cumulative analysis was the nearby UC Berkeley 2020 LRDP, and the development anticipated as a result of implementation of that plan. The LBNL risk assessment included the receptor locations of the top two UC Berkeley residential Maximally Exposed Individuals (MEIs) and the on-campus "sensitive receptor" MEI. (The top two MEIs were located on the northwest border of the UC Berkeley campus along Hearst Avenue several blocks west of LBNL. The on-campus sensitive receptor MEI was located at the Girton Hall Day Care Center.) These receptors were included in the LBNL risk assessment so that LBNL contribution to total potential maximum risk could be specifically added. UC Berkeley results at LBNL's MEI location were also considered in this cumulative analysis.

UC Berkeley incorporated results of the health risk assessment (discussed in Impact AQ-4) into a separate health risk assessment performed for the UC Berkeley 2020 LRDP to evaluate cumulative impacts of development pursuant to both LRDPs together, along with other relevant cumulative development in the vicinity. The results of the two health risk assessments overlaid upon one another indicate that, in a small area of maximum overlap, roughly north of Ridge

Road, east of La Loma Avenue and south of Buena Vista Way in Berkeley, estimates show that the existing cumulative cancer risks from both facilities currently exceeds ten in one million lifetime cancer risk, up to a maximum of approximately 17 in a million at limited locations. Future emissions from the facilities under their respective LRDPs would potentially extend the area exceeding a ten in one million lifetime cancer risk slightly to roughly north of Hearst Avenue, east of LeRoy Avenue and south of Codornices Park up to a maximum of approximately 22 in one million at limited sites. Therefore, the cumulative risk due to toxic air contaminant emissions from stationary and area sources under the LBNL 2004 LRDP and the UC Berkeley 2020 LRDP would be significant. The primary source of this risk is diesel particulate matter, and the assumptions used in this calculation are conservative: it is possible that implementation of the two LRDPs could help reduce this risk, as projects to replace and renovate existing facilities include replacement of existing diesel emitters. Furthermore, as discussed in the Setting and in Impact AQ-4, diesel particulate emissions will be reduced substantially in the future with implementation of new regulations and new technology. Although overall air quality health risks will decrease over time, the incremental effects of the existing and anticipated projects under the 2006 LRDP currently contribute, and will continue to contribute, to an exceedance of the modeled health risk in certain areas. Accordingly, even though the health risk assessment shows that health risk will decrease over time, and also shows that implementation of the 2006 LRDP slightly decreases health risk, the Lab has determined a conservative approach is appropriate and characterized this impact, on a cumulative basis only, as significant and unavoidable, because there are some emissions, primarily diesel particulates, related to Lab operations and implementation of the 2006 LRDP, which contribute to the existing and future exceedance.

Second, in terms of regional exposure levels, as described in the Setting section, the BAAQMD reported, based on 2002 data, an average Bay Area lifetime cancer risk from toxic air contaminants, *excluding* diesel particulate matter, of 162 in one million, or 46 percent less than the risk in 1995. The state Air Resources Board (CARB) put the Bay Area lifetime cancer risk from toxic air contaminants, again excluding diesel particulate, at 111 in one million in 2004. CARB also reported that the lifetime cancer risk from diesel particulate in the Bay Area was about 480 in one million, as of 2000, according to CARB, down from 750 in one million in 1990 and 570 in one million in 1995.

As described in Impact AQ-4, implementation of the proposed 2006 LRDP would not result in a project-specific increase in lifetime cancer risk at off-site receptors in excess of 10 in one million, and this impact would be less than significant. (One on-site receptor would sustain increased cancer risk of greater than 10 in one million, but this significant impact was found to be mitigated with implementation of Mitigation Measure AQ-4a.) Nevertheless, the lifetime cancer risk from exposure to emissions from Berkeley Lab at full implementation of the LRDP, including the contributions from existing sources and including emissions from mobile sources such as shuttle buses, would continue to exceed 10 in one million (as noted, the maximum total risk, for the Maximally Exposed Individual, would be approximately 50 in one million), even though there would be no incremental project-related increases in excess of that threshold. Although the Lab's contribution to total lifetime cancer risk at any location would be relatively small, compared to the average risk of 480 in one million throughout the Bay Area, this EIR considers the contribution to be considerable, and therefore the cumulative impact would be significant.

Mitigation: Because most of the cancer risk from TACs is due to diesel particulate, measures to reduce the risk (beyond regulations already in place that will substantially reduce diesel particulate emissions in the next 20 years) would include those measures that could reduce vehicular travel to and from Berkeley Lab. Implementation of Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program (see Section IV.L, Transportation/Traffic), would result in a concomitant decrease in vehicular emissions, including those of TACs. However, even with implementation of this measure, Berkeley Lab, as a major employer and thus a substantial source of vehicular traffic, would likely continue to contribute to Bay Area-wide emissions of TACs for the foreseeable future.

Project Variant. The project variant's contribution to cumulative emissions of toxic air contaminants would be substantially similar to the contribution to cumulative emissions of toxic air contaminants from the 2006 LRDP development. Thus, cumulative impacts related to emissions of toxic air contaminants from development pursuant to the project variant would be characterized, on a cumulative basis only, as significant and unavoidable for the reasons stated above.

Individual Future Project/Illustrative Development Scenario. A future project identified in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development, would also, for the reasons stated above, result in cumulative impacts related to emissions of toxic air contaminants that would be significant and unavoidable.

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IV.C. Biological Resources

IV.C.1 Introduction

This section discusses existing biological resources at the LBNL hill site and analyzes the potential for implementation of the 2006 LRDP to affect those resources. Biological resources of off-hill Lab-leased sites are not discussed here as they generally take place in fully urbanized areas of Berkeley, Oakland, and Walnut Creek. Information presented in the discussion and subsequent analysis was drawn from site visits (ESA, 2002a-c; ESA, 2003a-c); biological data presented in the California Department of Fish and Game's (CDFG) Natural Diversity Database (CNDDB)[1] and the California Native Plant Society's (CNPS) *Electronic Inventory of Rare and Endangered Vascular Plants of California*; an official species list for the project area from the U.S. Fish and Wildlife Service (USFWS, 2005a); standard biological references (Hickman, 1993; Zeiner et al., 1990; and Stebbins, 1985); LBNL's 1987 LRDP and its associated environmental impact reports; as well as surveys and environmental documents associated with specific LBNL projects. This EIR identifies potential effects of the proposed project on sensitive species and habitats and proposes mitigation measures to reduce those impacts to less-than-significant levels.

IV.C.2 Setting

LBNL is situated on the lower slopes of the Oakland-Berkeley hills and contains a mix of institutional development and open space. The site is located in the San Francisco Bay Area, which is characterized by a Mediterranean climate with moderately warm, dry summers and mild, wet winters. The steep topography of the site is a result of uplift along the Hayward fault. Slopes are dissected by a number of streams.

With two exceptions, drainages at LBNL are ephemeral or intermittent. One stream at LBNL is perennial, maintaining some water flow throughout the year: the North Fork of Strawberry Creek in the lower reaches of Blackberry Canyon (the "North Fork"). In addition, a tributary to the South Fork of Strawberry Creek in the lower reaches of the former Poultry Husbandry Area (and therefore known as Chicken Creek)[2] has been determined during different expert investigations to be either intermittent or perennial; for the purposes of this analysis, this drainage will be assumed to be perennial.[3] These drainages have been culverted through the developed areas of LBNL, and much of the site's drainage has been routed through a stormwater sewer system to the North Fork. Among other components, this stormwater sewer system involves a series of "hydraugers," which are generally horizontal drain pipes inserted into the hillside to draw off groundwater, some of

1 The CNDDB is a computer database of information on the location and distribution of animals and plants that are rare, threatened, endangered, or candidate species, or habitat considered to be of high quality or of limited distribution.

2 In a typical year, an ephemeral stream has flowing water only during and for a short duration after rainfall. Runoff from rainfall is the primary source of water for stream flow, and groundwater is not a source of water for the stream. An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow. A perennial stream has flowing water year-round during a typical year. Groundwater is the primary source and runoff from rainfall is a supplemental source of water for stream flow (Corps, 2002).

3 ESA, 2003c.

which otherwise would eventually reach the natural drainage channels. The remainder of site drainage is routed to tributaries that flow to the South Fork of Strawberry Creek.

The hills surrounding LBNL contain low-to moderate-density residential neighborhoods mixed with open space containing a mosaic of vegetation types and wildlife habitats, including oak and mixed hardwood forests, native and non-native grasslands, chaparral, coastal scrub, marsh and wetland communities, and riparian scrubs and forests. Developed areas of the LBNL hill site have been landscaped with a mix of non-native horticultural species and, more recently, California native plants and other drought-tolerant species suitable for landscaping purposes. Open space at LBNL is dominated by annual grassland, with eucalyptus and conifer stands planted throughout the site. Undeveloped areas along the eastern and southern perimeters of the site support a mosaic of coastal scrub and grassland. Woodlands dominated by oak and bay occur along most drainages at LBNL. Open space vegetation on the site is managed on an annual basis, either by goats or mechanical means, according to the guidelines set forth in LBNL's *Maintenance Vision for a Fire-Safe Sustainable Landscape* (LBNL, 2001).

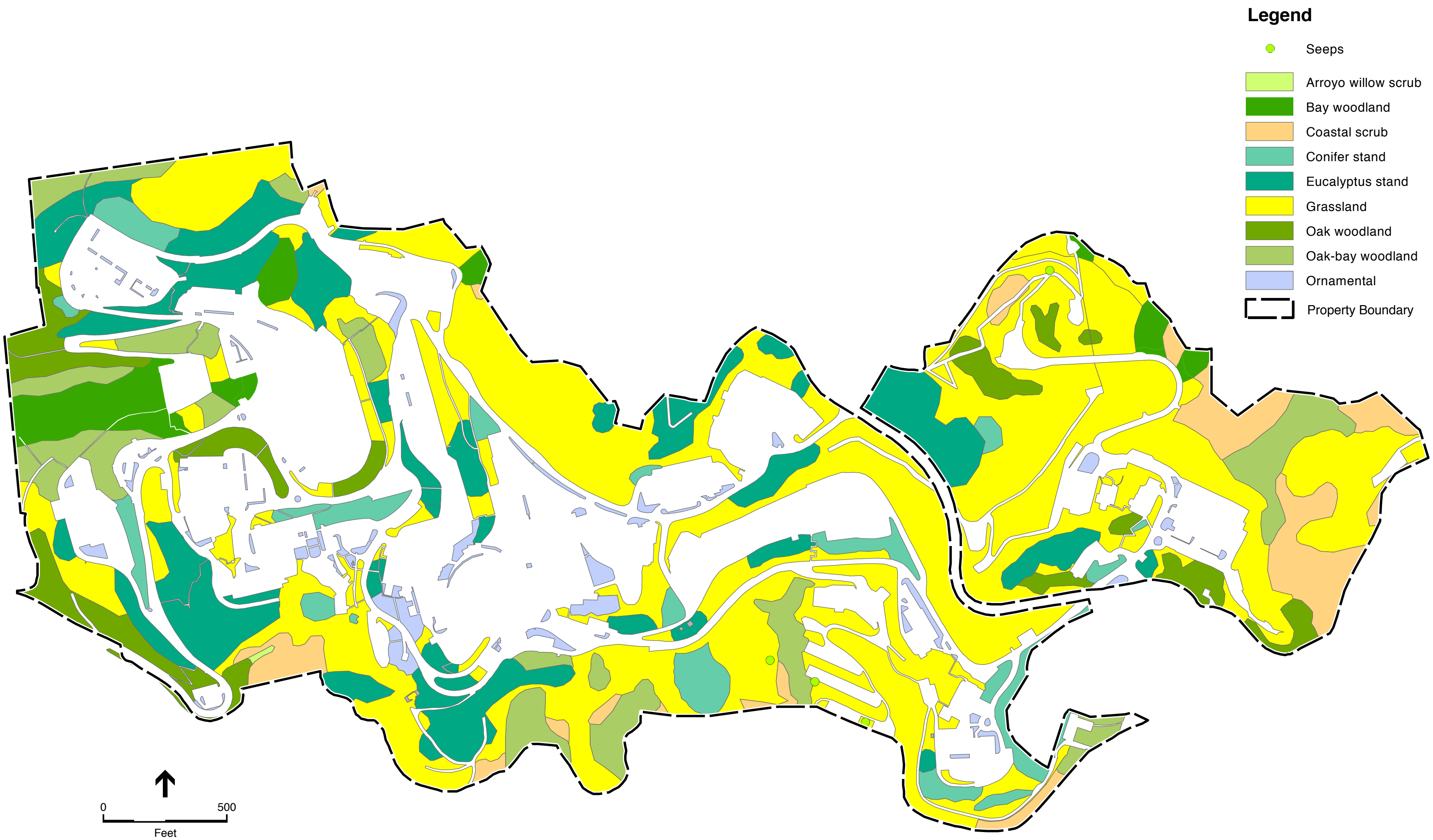
Wildlife observed in the more developed areas at LBNL during field surveys (ESA, 2002a-c; ESA, 2003a-c) includes common species tolerant of human presence such as California mule deer (*Odocoileus hemionus*), California towhee (*Pipilo crissalis*), chestnut-backed chickadee (*Poecile rufescens*), western scrub jay (*Aphelocoma californica*), and Anna's hummingbird (*Calypte anna*). Wildlife common in undeveloped areas throughout the East Bay hills has also been observed in riparian and coastal scrub habitat at LBNL, including northern flicker (*Colaptes auratus*), wrentit (*Chamaea fasciata*), song sparrow (*Melospiza melodia*), ruby-crowned kinglet (*Regulus calendula*), and golden-crowned sparrow (*Zonotrichia atricapilla*).

IV.C.2.1 Plant Communities and Wildlife Habitat

Vegetation communities are assemblages of plant species that occur together in the same area and are defined by species composition and relative abundance. The vegetation/habitat classification system for this project is based on Holland (1986) and influenced by the classification system of Sawyer and Keeler-Wolf (1995). Vegetation communities generally correlate with wildlife habitat types. Wildlife habitats were classified and evaluated using the CDFG's *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988). For each description below the name of the vegetation type is given first. When there is a correlated habitat type whose name differs from that of the vegetation type, this name follows. Please see Figure IV.C-1 for the locations of the various plant communities that occur throughout the LBNL site.

Grasslands

Grasslands make up approximately 67 acres on the LBNL site. Two grassland types occur on the LBNL site: annual grassland and mixed grassland. Historical land use practices have resulted in the replacement of much of the area's native perennial grasslands with non-native annual grasslands, scrub communities, and stands of non-native trees. Highly disturbed areas of the project site support non-native annual grassland, whereas areas subject to less disturbance support



SOURCE: LBNL; ESA (2003)

LBNL 2006 Long Range Development Plan . 201074

Figure IV.C-1
Vegetation at LBNL

a mixed grassland consisting of both annual non-natives and remnant native species. In addition, it appears that relatively recent plantings in some areas of the site feature native bunchgrasses.

Annual Grassland

Annual grassland, the dominant vegetation type on the LBNL site, is located primarily on the slopes between Centennial Drive and the developed portions of the site, on the south -facing slopes below Lawrence Road, and north of the Strawberry Canyon Gate. This vegetation type occurs as both an open grassland and as an understory in relatively open eucalyptus and pine stands. Dominant species include non-native annual grasses and other ruderal species, including wild oat (*Avena sativa*), ripgut brome (*Bromus diandrus*), Italian rye-grass (*Lolium multiflorum*), black mustard (*Brassica nigra*), rough cats-ear (*Hypochaeris radicata*), bristly ox-tongue (*Picris echioides*), cut-leaved geranium (*Geranium dissectum*), and Italian thistle (*Carduus pycnocephalus*).

Mixed Grassland

Mixed grassland appears on-site in small patches. This vegetation type is generally restricted to the steepest slopes where soils are not well-developed. Mixed grassland is found on road cuts along Cyclotron Road, in and around rock outcrops, and around the edges of coastal scrub stands. This vegetation type includes a mix of non-native annual and native perennial grasses and herbaceous species, including purple needlegrass (*Nasella pulchra*), blue wild-rye (*Elymus glaucus*), mugwort (*Artemisia douglasiana*), cudweed (*Gnaphalium* sp.), yarrow (*Achillea millefolium*), Pacific sanicle (*Sanicula crassicaulis*), and hedge nettle (*Stachys ajugoides* ssp. *ajugoides*).

Grasslands in the project area may provide habitat for reptiles and amphibians, such as western fence lizard (*Sceloporus occidentalis*), northern alligator lizard (*Elgaria coerulea*), and California slender salamander (*Batrachoseps attenuatus*), as well as birds, including mourning dove (*Zenaida macroura*) and golden-crowned sparrow. Mammals such as Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Spermophilus beecheyi*), and striped skunk (*Mephitis mephitis*) may browse and forage within the grassland, and thrive when varied natural habitats are available nearby. Small rodents attract raptors including red-tailed hawk (*Buteo jamaicensis*).

Coastal Scrub

There are approximately 8.5 acres of coastal scrub on the project site. Coastal scrub is a highly variable plant community and occurs at LBNL in two basic forms: California sagebrush scrub and coyote brush scrub.

California Sagebrush Scrub

This vegetation type makes up only a small proportion of the vegetative cover at LBNL and occurs primarily on thin soils and rock outcrops on south-facing slopes. The dominant shrub is California sagebrush (*Artemisia californica*), with sticky monkeyflower (*Diplacus aurantiacus*) and coyote brush sometimes occurring as subdominants. The understory can include mugwort and coyote mint (*Monardella villosa* ssp. *villosa*), with native perennial grasses such as purple needlegrass occurring in openings in the overstory.

Coyote Brush Scrub

In the Berkeley-Oakland hills, coastal scrub, especially coyote brush scrub, is often the successional phase between grassland and oak woodland. Disturbance sets this phase back to grasslands, and lack of disturbance generally promotes the establishment of oak woodlands and eventually a mixed oak-bay or bay forest (McBride, 1974). Coyote brush stands at LBNL are generally mature, with a nearly closed canopy and very little if any understory. Where an understory does occur it includes, among other species, California honeysuckle (*Lonicera hispidula* var. *vacillans*), bedstraw (*Galium* sp.), and hedge nettle (*Stachys ajugoides* ssp. *ajugoides*).

In moister spots, such as the drainages just to the south of Blackberry Canyon Gate, California blackberry (*Rubus ursinus*) can occur as a codominant with coyote brush (*Baccharis pilularis*), with elderberry (*Sambucus mexicana*), toyon (*Heteromeles arbutifolia*), ocean spray (*Holodiscus discolor*), and coast live oak occurring as widely scattered associates.

Coastal scrub provides nesting and foraging habitat for various birds, including spotted towhee (*Pipilo maculatus*), California towhee, common bushtit (*Psaltriparus minimus*), western scrub jay, and California quail (*Callipepla californica*). Raptors, including Cooper's hawk (*Accipiter* cooperii) and sharp-shinned hawk (*Accipiter striatus*), may forage over such areas and prey on some of these small birds as well as on small mammals and reptiles such as California ground squirrel, brush rabbit (*Sylvilagus bachmani*), and western fence lizard.

Arroyo Willow Riparian Scrub / Riparian Scrub

A small stand of arroyo willow riparian scrub, approximately 0.06 acre in size, is found along the drainage just south of Blackberry Canyon Gate. This area is dominated almost exclusively by arroyo willow (*Salix lasiolepis*), with California blackberry also occurring.

Riparian scrub and surrounding woodlands may support reptiles and amphibians such as western toad *(Bufo boreas)*, California newt (*Taricha torosa*), Pacific treefrog (*Hyla regilla*), and California slender salamander, which feed on plants as well as terrestrial and aquatic invertebrates. Resident and migratory birds often found in willow scrub include song sparrow, spotted towhee, yellow-rumped warbler *(Dendroica coronata)*, and Wilson's warbler (*Wilsonia pusilla*). Scrub jays and black phoebe (*Sayornis nigricans*) commonly forage extensively in riparian habitats. Mammals such as western harvest mouse *(Reithrodontomys megalotis)*, opossum *(Didelphis virginiana)*, and raccoon (*Procyon lotor*) also utilize riparian habitats for nesting and foraging.

Coast Live Oak Woodland

There are approximately nine acres of coast live oak woodland on the LBNL site. This vegetation type ranges in cover from sparse to dense canopy, with oak the only tree species present. Where oaks are widely spaced, annual or mixed grasslands occur in the understory. Where canopy is dense, primarily in the drainages on the site, understory associates include California blackberry, California honeysuckle, and rush (*Juncus* sp.). In general, oak woodland communities can support an abundant assortment of common reptiles, amphibians, and small mammals such as western skink *(Eumeces skiltonianus)*, Pacific treefrog, northern alligator lizard (*Elgaria coerulea)*, gopher snake (*Pituophis melanoleucus)*, arboreal salamander (*Aneides lugubris*), and deer mouse *(Peromyscus maniculatus).* Resident and migratory bird species found in oak woodlands include spotted towhee, brown creeper (*Certhia americana*), oak titmouse *(Parus inornatus),* Hutton's vireo *(Vireo huttoni),* western scrub jay, northern flicker, dark-eyed junco *(Junco hyemalis)*, downy woodpecker *(Picoides pubescens),* and orange-crowned warbler *(Vermivora celata).* Raptors that breed and nest in local woodland communities include red-tailed hawk (*Buteo jamaicensis*), sharp-shinned hawk *(Accipiter striatus),* Cooper's hawk *(Accipiter cooperii)*, and others. Oak woodland can also provide breeding and roosting habitat for bats, including fringed myotis (*Myotis thysanodes*) and long-eared myotis (*Myotis evotis*).

California Bay Woodland

California bay woodlands dominate many of the drainages at LBNL, most notably in Blackberry Canyon. This vegetation type covers approximately 5.5 acres and is dominated by California bay, with coast live oak and big-leaf maple (*Acer macrophyllum*) occurring occasionally. Understory species are often absent where the tree canopy is most dense; when they do occur, in more open stands, understory species can include fairy bells (*Disporum hookeri*), coastal wood fern (*Dryopteris arguta*), California honeysuckle, Stebbin's grass (*Erharta erecta*), and hedge nettle.

California bay woodlands provide habitat for slender salamanders and varied thrush (*Ixoreus naevius*), and potential nesting habitat for American robin (*Turdus migratorius*), western scrub jay, and Steller's jay (*Cyanocitta stelleri*). Other species that may use this woodland type include California black-tailed deer, raccoon, and opossum.

Oak-Bay Woodland

This vegetation type, covering approximately 12 acres at LBNL, is similar to the two preceding types but is dominated by a mix of coast live oak and California bay. Understory is variable according to canopy density, and the composition of the wildlife community expected in oak-bay woodland is similar to that for the woodlands dominated by a single species, as described above.

Eucalyptus Stands

Non-native eucalyptus stands make up approximately 22 acres of the vegetative cover at LBNL. Mature blue gum eucalyptus (*Eucalyptus globulus*) is generally the only species in the overstory canopy. Beginning in the late 1800s, this species was widely planted throughout the Oakland-Berkeley hills. Understory vegetation is typically sparse and consists primarily of non-native weedy species, including Italian thistle (*Carduus pycnocephalus*), bristly ox-tongue (*Picris echiodes*), and a variety of grasses, including wild oat (*Avena* sp.) and zorro grass (*Vulpia myuros*). Occasionally, where the eucalyptus overstory is widely spaced, shrubs such as coyote brush can be found in the understory.

Mature eucalyptus groves provide nesting habitat for a number of raptors, including red-tailed hawks, red-shouldered hawks (*Buteo lineatus*), and great horned owls (*Bubo virginianus*). Eucalyptus may also provide roosting and nursery sites for several bat species, including fringed myotis and long-eared myotis.

Conifer Stands

Conifer stands consisting of tree species that are not native to the Oakland-Berkeley hills occur throughout LBNL and cover approximately seven acres of the vegetation. These stands are often made up of a single species, are generally even-aged, consist of mature trees, and have a relatively open canopy. Conifer species found at LBNL include coast redwood (*Sequoia sempervirens*), Monterey pine (*Pinus radiata*), Torrey pine (*Pinus torreyana*), and Canary Island pine (*Pinus canariensis*). The understory in conifer stands is most often made up of non-native grasses and can be sparse where thick layers of duff have formed. As is the case with eucalyptus stands, nesting raptors may make use of mature trees. Pines with cavities and dead trees may provide nesting habitat for American kestrel and woodpeckers, and roosting and nursery sites for bats.

Freshwater Seep / Fresh Emergent Wetland

At least four freshwater seeps occur at LBNL (ESA, 2003b and 2003c). One of these is located in a drainage at the eastern perimeter near the new water tower. This seep had standing water in late October 2003, when the continuing drainage below was dry, and supports seep monkeyflower (*Mimulus guttatus*), nutsedge (*Cyperus eragrostis*), and willow herb (*Epilobium ciliatum*). Another seep occurs in the Poultry Husbandry Area, apparently created by the installation of a hydrauger to drain the hillside just upslope. Surface flow from the hydrauger supplies the seep with a fair amount of water. This flow appears to continue downslope, probably subsurface, as there is a stand of willow scrub just beyond the fenceline. The seep appears to have been in existence for quite some time, due to the fact that it supports several mature willows. Other vegetation near this seep includes cattail (*Typha latifolia*) and watercress (*Rorippa nasturtium-aquaticum*). Two other seeps occur along the slopes to the west of the Poultry Husbandry area, one on either side of Chicken Creek. Both of these are dominated almost exclusively by a single unidentified sedge, with California blackberry and poison oak contributing a very small amount of total cover. These seeps had moist, but not saturated, soils at the time of observation (ESA, 2003c).

Seep habitat with perennial water can provide an important source of water for animals during the dry season, including amphibians such as slender salamander and Pacific treefrog, California mule deer, raccoon, and a wide variety of birds.

Aquatic Habitat

Most of the drainages at LBNL are ephemeral and only provide aquatic habitat for a limited time during and shortly after rainfall events. Aquatic habitat in these drainages is further limited in value due to the small size of the drainages, the lack of habitat diversity, the absence of perennial stream-flow, and the lack of direct connection to larger waters capable of supporting fish and amphibians. These drainages may provide some instream habitat for aquatic invertebrates. However, it is highly improbable that fish are present in these drainages, and the general lack of instream vegetation makes it highly unlikely that amphibians would use these streams for breeding purposes. The North Fork of Strawberry Creek and Chicken Creek have, for most of their lengths through LBNL, been filled and culverted. These perennial streams receive stormwater runoff from the developed areas of LBNL, as well as groundwater. While there is perennial flow in these streams, the gradient is high and little instream vegetation is present. In the aboveground portions of these creeks, the beds are scoured to bedrock in places, as is the case with the North Fork, or have been hardened in places, as is the case with Chicken Creek. Due to culverting and hardening, these streams are no longer directly hydrologically connected to Strawberry Creek and, in addition, currently receive greater peak flows than they would naturally due to development in their watersheds. These factors combine to provide poor habitat for most aquatic organisms. The North Fork supports aquatic macroinvertebrates, but in lower numbers and diversity than in the upper reaches of the South Fork of Strawberry Creek (Charbonneau, 1987). Chicken Creek likely supports limited numbers of aquatic macroinvertebrates as well. However, neither of these streams appears to possess the characteristics necessary to support fish or breeding populations of amphibians.

Landscaped Areas

Landscaped areas throughout LBNL are primarily confined to areas adjacent to buildings. Plants in these areas are often common horticultural species. Landscaping installed since the 1987 LRDP generally consists of drought-tolerant species, including a mix of non-native and native plants. Landscaped areas can provide foraging and nesting habitat for a variety of bird species, especially those that are tolerant of disturbance and human presence. Birds commonly found in such areas include the non-native English sparrow (*Passer domesticus*), house finch (*Carpodacus mexicanus*), dark-eyed junco (*Junco hyemalis*), and Anna's hummingbird. Reptiles using this type of habitat may include garter snake (*Thamnophis* sp.) and western fence lizard.

IV.C.2.2 Special-Status Species

For the purposes of this EIR, the term "special-status species" includes species that are listed and receive specific protection defined in federal or state endangered species legislation, as well as species not formally listed as threatened or endangered but designated as species "of concern," or as "rare" or "sensitive" on the basis of adopted policies and expertise of federal or state resource agencies or organizations with acknowledged expertise, including the U.S. Fish and Wildlife Service, California Department of Fish and Game, National Marine Fisheries Service (now known as "NOAA Fisheries"[4]), and the California Native Plant Society. Specifically, the following categories are included: federally listed endangered and threatened species; species proposed for listing as endangered or threatened; candidates for such listing; federally identified species of concern and species of local concern; state-listed endangered and threatened species,

4 The National Oceanic and Atmospheric Administration Fisheries Service, or NOAA Fisheries, formerly the National Marine Fisheries Service or NMFS, has responsibility for fisheries resources, but has no jurisdiction over upland areas where there is no stream access for anadromous fish, such as LBNL.

and rare (plants only) species; California Species of Special Concern; species designated "special animals" by the state; "fully protected" species (of which there are about 35, most of which are also listed as either endangered or threatened); and raptors (birds of prey), which are specifically protected by Fish & Game Code Section 3503.5, which prohibits the take, possession, or killing of raptors and owls, their nests, and their eggs.[5] (The project area does not contain any applicable special-status species designated by local agencies.) These species are referred to collectively as "special-status species" following a convention that has developed in practice but has no official sanction. Special-status species in the project area are protected under the federal and California Endangered Species Acts, the California Native Plant Protection Act, or the California Fish and Game Code, which are discussed under Federal and State Regulatory Setting, p. IV.C-25.

A list of special-status plant and animal species reported to occur in the vicinity of the project site was compiled on the basis of data in the California Natural Diversity Database (CDFG, 2005), the California Native Plant Society Electronic Inventory (CNPS 2005), special-status species information from the U.S. Fish and Wildlife Service (USFWS, 2005a), and biological literature of the region. Table IV.C-1 is intended to be comprehensive and includes species for which potential habitat (i.e., general habitat types) occurs within or in the vicinity of the project site. With the exception of Cooper's hawk, a California species of concern, and red-tailed hawk and American kestrel, both protected under Section 3503.5, no special-status plants or wildlife were identified at LBNL during recent field surveys (ESA, 2005; ESA, 2002a, 200b2b, 2002c; and ESA, 2003a, 2003b, 2003c), although other special-status species are judged to have at least a moderate potential to occur, based on habitat conditions, as discussed below.[6]

Animal Species Assessed in Detail

Potential impacts of the project on special-status species were assessed based on the literature review, professional judgment, and the following procedure:

1) Determination of Susceptibility. This determination is a three-level process that evaluated for each species: (a) potential occurrence in the study area (generally, the terrestrial and aquatic habitats of the project site); (b) potential occurrence within the project footprint (i.e., the area proposed for future construction[7] under the LRDP); or (c) absence from either the study area or proposed construction sites. Federally or state endangered or threatened species were fully considered if potential suitable habitat exists at the project site, no matter how marginal. Species for which no potential suitable habitat exists at the project site (i.e. the species only occurs in chaparral or sandy washes) were given no further consideration.

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5 The inclusion of birds protected by Fish & Game Code Section 3503.5 is in recognition of the fact that these birds are substantially less common in California than most other birds, having lost much of their habitat to development, and the recognition that the populations of these species are therefore substantially more vulnerable to further loss of habitat and to interference with nesting and breeding than are most other birds. It is noted that a number of raptors and owls are already specifically listed as threatened or endangered by state and federal wildlife authorities.

6 CEQA Guidelines Section 15380 provides that a plant or animal species, even if not on one of the official lists, may be treated as "rare or endangered" if, for example, it is likely to become endangered in the foreseeable future.

7 For the purposes of this EIR, the term "construction," unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

TABLE IV.C-1
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE LBNL LONG RANGE DEVELOPMENT PLAN

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG/CNPS**	**General Habitat**	**Potential for Species Occurrence Within the Project Area**	**Period of Identification**
SPECIES LISTED OR PROPOSED FOR LISTING				
Invertebrates				
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT/--/--	Serpentine bunchgrass grassland, larvae feed on *Plantago erecta*	**Unlikely.** Grasslands in project area do not occur on serpentine and are not known to support larval host plants.	March–May
Callippe silverspot butterfly *Speyeria callippe callippe*	FE/--/--	Coastal areas in dunes, prairie, scrub, and grasslands supporting *Viola pedunculata*	**Unlikely.** Species' host plant is not known to occur in the grasslands on the project site.	Spring
Fish				
Central California coastal steelhead *Oncorhynchus mykiss*	FT/CSC/--	Unblocked Bay Area and coastal rivers and streams	**Unlikely.** Strawberry Creek contains downstream barriers to migration of this species. With the exception of the North Fork, drainages at LBNL are not large enough to support the species.	Year-round
Winter-run chinook salmon *Oncorhynchus tshawytscha*	FE/CE/--	Unblocked Bay Area and coastal rivers and streams	**Unlikely.** Strawberry Creek contains downstream barriers to migration of this species. Most on-site drainages are not large enough to support the species.	Winter
Amphibians				
California tiger salamander *Ambystoma californiense*	FT/CSC/--	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds and vernal pools	**Unlikely.** Suitable aquatic habitat for this species is not present within the project area.	November–May
California red-legged frog *Rana aurora draytonii*	FT/CSC/--	Breed in stock ponds, pools, and slow-moving streams with emergent vegetation for escape cover and egg attachment	**Unlikely.** On-site drainages do not provide suitable aquatic habitat for this species. No species occurrences are reported within several miles of the project site.	May–November
Reptiles				
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT/CT/--	Inhabits open to partially open scrub communities, including coyote bush scrub and chamise chaparral on primarily south-facing slopes	**Low to moderate potential.** Low-quality suitable habitat for this species is present within the project area. Unlikely that occupied territory is present on-site, but species may disperse through the site.	Spring
Birds				
American peregrine falcon *Falco peregrinus*	Delisted/CE/--	Forages in marshes and grasslands; nesting habitat includes high, protected cliffs and ledges near water	**Unlikely.** Suitable nesting habitat is not present within the project area. May forage in the vicinity of the project area.	Year-round
Bald eagle *Haliaeetus leucocephalus*	FT/CE/--	Nests and forages on inland lakes, reservoirs, and rivers; winter foraging at lakes and along major rivers	**Unlikely**. No suitable foraging or nesting habitat in project vicinity.	Winter

TABLE IV.C-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE LBNL LONG RANGE DEVELOPMENT PLAN

Common Name ***Scientific Name***	**Listing Status USFWS/ CDFG/CNPS**	**General Habitat**	**Potential for Species Occurrence Within the Project Area**	**Period of Identification**
		SPECIES LISTED OR PROPOSED FOR LISTING (cont.)		
Plants				
Large-flowered fiddleneck *Amsinckia grandiflora*	FE/CE/1B.1	Valley grassland, foothill woodland, annual grassland	**Low potential.** Project site contains marginally suitable habitat; however, only three natural occurrences are known, the nearest in east Alameda County (CNPS, 2005).	April–May
Pallid manzanita *Arctostaphylos pallida*	FT/CE/1B.1	Broadleaved upland forest, cismontane woodland, closed-cone coniferous forest, chaparral, and coastal scrub; found in siliceous shale, sandstone, or gravelly substrates	**Unlikely.** The project site does not contain suitable soils for this species. Species is readily recognizable and not seen during ESA's field surveys.	December–March
Robust spineflower *Chorizanthe robusta var. robusta*	FE/--/1B.1	Sandy or gravelly openings in cismontane woodland; also coastal dunes and coastal scrub	**Unlikely.** Suitable habitat is not present on the project site (i.e., tree and shrub cover is too dense). Not seen in Alameda or adjacent counties since the 1890s; presumed extirpated in Bay Area (CNPS, 2005).	April–September
Presidio clarkia *Clarkia franciscana*	FE/CE/1B.1	Serpentine outcrops in coastal scrub and valley and foothill grassland	**Unlikely.** Although grassland is present, no serpentine outcrops observed in project area.	May–July
Santa Cruz tarplant *Holocarpha macradenia*	FT/CE/1B.1	Light, sandy, or sandy clay soil in coastal prairie and scrub and in valley and foothill grassland; often with non-native associates	**Unlikely.** Marginally suitable habitat is present in the project area, but naturally occurring populations have been extirpated from the Bay Area (CNPS, 2005).	June–October
San Francisco popcorn flower *Plagiobothrys diffusus*	FSC/CE/1B.1	Coastal prairie and valley and foothill grassland	**Low potential.** The project site provides marginally suitable habitat. Species is known from fewer than 10 occurrences.	April–June
		FEDERAL OR STATE SPECIES OF CONCERN		
Invertebrates				
Monarch butterfly *Danaus plexippus*	--/*/--	Winters in eucalyptus groves; winter roosting sites protected by the state	**Low potential.** Suitable habitat exists on-site, but the species has not been documented as wintering within the project area.	Winter
Bridges' Coast Range shoulderband snail *Helminthoglypta nickliniana bridgesi*	FSC/--/--	Inhabits open hillsides; prefers rock piles but can be found under tall grasses and weeds	**Low potential.** Marginally suitable habitat is present in the project area, but all sightings are historic.	Year-round
Ricksecker's water scavenger beetle *Hydrochara rickseckeri*	FSC/--/--	Specific habitat requirements are unknown; requires calm, shallow water of ponds and streams	**Low potential.** Suitable aquatic habitat is not present in the project area.	Unknown

TABLE IV.C-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE LBNL LONG RANGE DEVELOPMENT PLAN

Common Name ***Scientific Name***	**Listing Status USFWS/ CDFG/CNPS**	**General Habitat**	**Potential for Species Occurrence Within the Project Area**	**Period of Identification**
		FEDERAL OR STATE SPECIES OF CONCERN (cont.)		
Invertebrates (cont.)				
Lee's micro-blind harvestman *Microcina leei*	--/*/--	Requires undisturbed rocks in native grasslands and woodlands	**Observed.** Known to be present in Blackberry Canyon.	Year-round
San Francisco lacewing *Nothochrysa californica*	FSC/--/--	Coastal scrub and woodlands	**High potential.** May occur in woodland and coastal scrub habitat on the project site. Known to occur in Strawberry Canyon.	January–July
Birds				
Cooper's hawk *Accipiter cooperi*	--/CSC/--	Nests in riparian growths of deciduous trees and live oak woodlands	**Observed.** Nesting habitat is available on-site. Observed with kill at Bldg. 49 site (ESA, 2003a).	March–July
Sharp-shinned hawk *Accipiter striatus*	--/CSC/--	Nests in riparian growths of deciduous trees and live oaks	**Moderate potential.** Potential nesting habitat is present on the larger streams at LBNL.	March–July
Tricolored blackbird *Agelaius tricolor*	FSC/CSC/--	Riparian thickets and emergent vegetation	**Unlikely.** Typical nesting habitat used by this species is not present in large enough amounts in the project area.	Spring
Grasshopper sparrow *Ammodramus savannarum*	FSC/--/--	Dry, dense grasslands, especially with a variety of grasses and tall forbs and scattered shrubs	**Low potential.** Suitable habitat is present on the project site, but species frequents more arid areas.	April–July
Bell's sage sparrow *Amphispiza belli belli*	FSC/CSC/--	Inhabits arid areas with low, fairly dense stands of shrubs, including chamise chaparral and coastal sage scrub	**Low potential.** Suitable scrub habitat is present on the project site, but species frequents more arid areas.	Year-round
Golden eagle *Aquila chrysaetos*	--/CSC/--	Nests in canyons and large trees in open habitats; prefers to forage in habitat with dense ground squirrel populations	**Unlikely.** While suitable foraging habitat exists, nesting habitat is not present on-site.	Year-round
Burrowing owl *Athene cunicularia*	FSC/CSC/--	Nests in mammal burrows in open, lowland grasslands; also uses man-made structures	**Unlikely.** Suitable nesting habitat is not present at LBNL.	February–June
Oak titmouse *Baelophus inornatus*	FSLC/--/--	Inhabits open oak woodlands and oak savannah	**Low potential.** Species is relatively rare on western slopes of East Bay hills due to generally high density of oak habitat.	Year-round
Great horned owl *Bubo virginianus*	--/3503.5/--	Often uses abandoned nests of corvids or squirrels; nests in large oaks, conifers, eucalyptus	**Moderate potential.** Suitable nesting habitat occurs in eucalyptus and conifer stands at LBNL.	Year-round
Red-tailed hawk *Buteo jamaicensis*	--/3503.5/--	Usually nests in large trees, often in woodland or riparian deciduous habitats	**Observed.** Suitable nesting habitat is present in stands of large trees. Observed foraging at LBNL (ESA, 2002a).	Year-round

TABLE IV.C-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE LBNL LONG RANGE DEVELOPMENT PLAN

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG/CNPS**	**General Habitat**	**Potential for Species Occurrence Within the Project Area**	**Period of Identification**
FEDERAL OR STATE SPECIES OF CONCERN (cont.)				
Birds (cont.)				
Lark sparrow *Chondestes grammacus*	FSC/--/--	Inhabits sparse valley foothill hardwood, open mixed chaparral and brushy habitats, grasslands with scattered trees or shrubs	**Unlikely.** Suitable nesting habitat is not present in the project area, as the canopy cover is too dense.	Year-round
Northern harrier *Circus cyaneus*	--/CSC/--	Most commonly found foraging over marshes and open fields. Nests on slightly elevated ground or in thick vegetation.	**Unlikely.** Suitable nesting habitat is not present in the project area. May be occasional forager in open grasslands on-site.	Year-round
Olive-sided flycatcher *Contopus cooperi*	FSC/--/--	Inhabits open conifer or mixed woodlands; nests in large coniferous trees	**Moderate potential.** Suitable habitat is present at LBNL, but species relatively rare in East Bay hills.	May-August
White-tailed kite *Elanus leucurus*	FSC/CFP	Nests near wet meadows and open grasslands, in dense oak, willow, or other tree stands	**Low potential.** Open foraging habitat is located in the project area; however, this species rarely seen in the Oakland-Berkeley hills.	March–July
Pacific-slope flycatcher *Empidonax difficilis*	FSC/--/--	Warm, moist woodlands, including valley foothill and montane riparian, coastal and blue oak woodlands, and montane hardwood-conifer habitats	**Moderate potential.** Potential nesting habitat is located in riparian vegetation at LBNL.	Summer
California horned lark *Eremophila alpestris actia*	--/CSC/--	Nests and forages in short-grass prairie, mountain meadow, coastal plain, fallow fields, and alkali flats	**Unlikely.** Project site does not provide suitable habitat.	March–July
Merlin *Falco columbarius*	--/CSC/--	Breeds outside California; inhabits coastlines, open grasslands, savannahs, and woodlands	**Unlikely.** May visit site in winter or during migration to breeding habitat outside California.	September–May
American kestrel *Falco sparverius*	--/3503.5/--	Frequents generally open grasslands, pastures, and fields; primarily a cavity nester	**Observed.** Observed on-site (ESA, 2003b). Potential nesting habitat available in cavities in mature oaks or pines.	Year-round
Yellow-breasted chat *Icteria virens*	--/CSC/--	Nests in riparian corridors with willows or other dense foliage	**Low potential.** Riparian vegetation present and may provide nesting habitat for this species, but small patch size makes nesting unlikely.	March–September
Loggerhead shrike *Lanius ludovicianus*	FSC/CSC/--	Nests in shrublands and forages in open grasslands	**Unlikely.** Suitable grassland habitat is not present in the project area.	March–September
Lewis' woodpecker *Melanerpes lewis*	FSC/--/--	Nests in cavities of dead or burned out trees in open, deciduous, and conifer habitats with brushy understory	**Low potential.** Rarely occurs on the west side of East Bay hills in oak woodland habitat in winter. Oak woodland habitat too dense to be suitable for nesting.	Winter

TABLE IV.C-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE LBNL LONG RANGE DEVELOPMENT PLAN

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG/CNPS**	**General Habitat**	**Potential for Species Occurrence Within the Project Area**	**Period of Identification**
		FEDERAL OR STATE SPECIES OF CONCERN (cont.)		
Birds (cont.)				
Rufous hummingbird *Selasphorus rufus*	FSC/--/--	Inhabits riparian areas, open woodlands, chaparral, and other habitat with nectar-producing flowers; breeding does not occur in San Francisco Bay Area	**Low potential.** May forage on the project site and in surrounding areas.	February–April
Allen's hummingbird *Selasphorus sasin*	FSC/--/--	Inhabits coastal scrub, valley foothill hardwood, and riparian habitats	**High potential.** Trees and shrubs within riparian corridors provide potential nesting habitat.	January–July
Red-breasted sapsucker *Sphyrapicus ruber*	FSC/--/--	Breeds in coastal forests of Northern California and Oregon	**Unlikely.** May occur occasionally and locally in winter, but does not breed in the area.	November–March
Bewick's wren *Thryomanes bewickii*	FSC/--/--	Inhabits chaparral, scrub, and landscaped areas; may also be found in riparian and edges of woodland habitats	**Moderate potential.** Preferred habitat is present throughout LBNL.	Year-round
California thrasher *Toxostoma redivivum*	FSC/--/--	Moderate to dense chaparral and scrub, open valley foothill riparian thickets	**Moderate potential.** Low-quality suitable habitat is present on the project site.	Year-round
Mammals				
Pallid bat *Antrozous pallidus*	CSC/--	Day roosts include rock outcrops, mines, caves, hollow trees, buildings and bridges. Recent research suggests high reliance on tree roosts	**Moderate potential.** Suitable roost habitat present on-site in trees and buildings. Suitable foraging habitat on the project site.	March-August
Townsend's big-eared bat *Corynorhinus townsendii*	FSC/CSC/--	Inhabits a variety of habitats, requires caves, mines, or man-made structures for roosting	**Low potential.** Suitable roosting habitat is not present on the project site, but the species may forage in the area.	March-August
Berkeley kangaroo rat *Dipodomys heermanni berkeleyensis*	FSC/--/--	Open, grassy hilltops and open spaces in chaparral and blue oak/gray pine woodland	**Low potential.** Marginally suitable habitat is present in the project area; species is presumed extinct; however, USFWS has special concern.	Year-round
Greater western mastiff bat *Eumops perotis californicus*	FSC/CSC/--	Breeds in rugged, rocky canyons and forages in a variety of habitats	**Low potential.** Suitable roosting habitat is not present in the project area, but the species may forage in the area.	March–August
Long-eared myotis *Myotis evotis*	FSC/--/--	Inhabits woodlands and forests up to approximately 8,200 feet in elevation; roosts in crevices and snags	**Moderate potential.** Suitable foraging and roosting habitat is present in the project area.	March–August
Fringed myotis Myotis thysanodes	FSC/--/--	Inhabits a variety of woodland habitats, roosts in crevices or caves, and forages over water and open habitats	**Moderate potential.** Suitable foraging and roosting habitat is present on the project site.	March–August

TABLE IV.C-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE LBNL LONG RANGE DEVELOPMENT PLAN

Common Name *Scientific Name*	**Listing Status USFWS/ CDFG/CNPS**	**General Habitat**	**Potential for Species Occurrence Within the Project Area**	**Period of Identification**
FEDERAL OR STATE SPECIES OF CONCERN (cont.)				
Mammals (cont.)				
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	FSC/CSC/--	Forests with moderate canopy and moderate to dense understory	**Low potential.** Although the project site provides marginally suitable habitat for this species, it does not tend to occur in areas where human presence is high.	Year-round
Plants				
Bent-flowered fiddleneck *Amsinckia lunaris*	FSLC/--/1B.2	Coastal bluff scrub, woodland, and valley and foothill grassland	**Low potential.** Marginally suitable habitat is present on the project site, but records from Oakland-Berkeley hills are historic only.	March–June
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	FSLC/--/1B.2	Woodland and valley and foothill grassland, sometimes on serpentine soils	**Moderate potential.** Low-quality suitable habitat is present on the project site.	March–June
Mt. Diablo fairy-lantern *Calochortus pulchellus*	FSLC/--/1B.2	Woody and shrubby slopes of chaparral, cismontane, and riparian woodland, and valley and foothill grassland	**Low potential.** Marginally suitable habitat is present on the project site, but the species is not known from Oakland-Berkeley hills.	April–June
Western leatherwood Dirca occidentalis	FSLC/--/1B.2	On brushy slopes and mesic areas of chaparral, riparian woodland and forest, and broadleaf or coniferous forest	**Low potential.** Suitable habitat is present on the project site. However, the species was not observed during site surveys (ESA, 2002 and 2003).	January–April
Round-leaved filaree *Erodium macrophyllum*	--/--/2.1	On clay soils in woodland and valley and foothill grasslands	**Low potential.** Marginally suitable habitat is present on the project site; however, most collections are historical (CNPS, 2005).	March–May
Diablo helianthella *Helianthella castanea*	FSC/--/1B.2	Broadleaf upland forest, cismontane woodland, chaparral, coastal scrub, riparian woodland, and valley and foothill grassland	**Moderate potential.** Low-quality suitable habitat is present on the project site.	April–June
Fragrant fritillary *Fritillaria liliacea*	FSC/--/1B.2	Cismontane woodland, coastal prairie and scrub, valley and foothill grasslands, often on serpentine soils	**Low potential.** Serpentine soils are not present on the project site. The species is unlikely to be found on other soils due to competition with non-native species.	February–April
Kellogg's horkelia *Horkelia cuneata* spp. *sericea*	FSC/--/1B.1	In sandy or gravelly openings of closed-cone coniferous forest, chaparral and coastal scrub	**Low potential.** Suitable habitat is not present on the project site. Presumed extirpated in Alameda County (USFWS, 2005a).	April–September
Large-flowered leptosiphon (linanthus) *Leptosiphon grandiflorus* (formerly *Linanthus grandiflorus)*	FSC/--/4.2	Cismontane woodlands, valley and foothill grassland, coastal scrub	**Moderate potential.** While habitat is of low quality, the species was recently documented from Wildcat Peak (CalFlora, 2003).	April–August

TABLE IV.C-1 (Continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE LBNL LONG RANGE DEVELOPMENT PLAN

Common Name *Scientific Name*	Listing Status USFWS/ CDFG/CNPS	General Habitat	Potential for Species Occurrence Within the Project Area	Period of Identification
FEDERAL OR STATE SPECIES OF CONCERN (cont.)				
Plants (cont.)				
Oregon meconella *Meconella oregano*	FSC/--/1B.1	Coastal scrub and prairie	**Moderate potential.** Low-quality suitablehabitat is present at LBNL. Known only from five occurrences, including Oakland East, Richmond, and Briones Valley quads.	March–April
Robust monardella *Monardella villosa* ssp. *globosa*	FSLC/--/1B.2	In clay or sandy soils of coastal prairie and scrub, and valley and foothill grassland	**Moderate potential.** Low-quality suitable habitat is present on the project site.	June–July
Most beautiful jewel-flower *Streptanthus albidus* ssp. *peramoenus*	FSC/--/1B.2	Ridges and slopes with chaparral, valley and foothill grassland, and woodland; on serpentine outcrops	**Low potential.** Although mixed grasslands occur on-site, no serpentine soils or outcrops were observed in the project area.	April–June

STATUS CODES:

High potential = High to moderate quality habitat present and site within the geographic range; species expected to occur.

Moderate potential = Low to moderate quality habitat present, or habitat suitable but not within species' reported geographic range.

Low potential = Habitat highly limited or only marginally suitable or species may not be reported within the region.

Unlikely = Habitat does not meet species requirements as currently understood in the scientific community and/or site not within currently known species distribution or range.

Federal: (U.S. Fish and Wildlife Service)

FE = Listed as endangered (in danger of extinction) by the federal government
FT = Listed as threatened (likely to become endangered within the foreseeable future) by the federal government
PE/PT = Proposed for listing as endangered or threatened or threatened
FC = Candidate to become a *proposed* species
FSC = Former federal species of concern; may be endangered or threatened, but not enough biological information has been gathered to support listing at this time
FSLC = Former federal species of local concern. FWS no longer lists FSC and FSLC species.

State: (California Department of Fish and Game)

CE = Listed as endangered by the State of California
CT = Listed as threatened by the State of California
CR = Listed as rare by the State of California (plants only)
CSC = California Species of Special Concern
CFP = California Fully Protected
* = Species designated as "Special Animals" by the state
3503.5 = California Fish and Game Code Section 3503.5, Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)

California Native Plant Society

List 1A=Plants presumed extinct in California
List 1B=Plants rare, threatened, or endangered in California and elsewhere
List 2= Plants rare, threatened, or endangered in California but more common elsewhere
List 3= Plants about which more information is needed
List 4= Plants of limited distribution

An extension reflecting the level of threat to each species is appended to each rarity category as follows:
.1 – Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

SOURCES: CalFlora, 2003; CDFG, 2004; CNPS, 2006; USFWS, 2005a; Zeiner et al., 1990.

2) Further Analysis of Species Occurrence. If a species was determined to have the potential to occur in the project study area, further analyses were made of life history, habitat requirements, and the suitability of habitat for the species found within the study area or its immediate vicinity. The results of this determination for each species are provided in the "Potential for Species Occurrence Within the Project Area" column of Table IV.C-1.

3) Analysis of Project Effects. If suitable habitat was determined present within the proposed project vicinity, and the species had been documented as observed within the project area or had at least a moderate potential to occur, additional analysis considered whether the species would be affected by the project. Both direct effects (e.g., displacement of habitat) and indirect effects (e.g., noise) were considered. In addition, life history and habitat requirements were evaluated to ascertain the likelihood and severity of impact.

Of the special-status plants and animals presented in Table IV.C-1, p. IV.C-11, only the following species, which were observed or determined to have at least a moderate potential to occur within the project vicinity, are fully considered in the impact analysis:

- Lee's micro-blind harvestman
- San Francisco lacewing
- Alameda whipsnake
- Cooper's hawk
- Sharp-shinned hawk
- Red-tailed hawk
- American kestrel
- Great horned owl
- Olive-sided flycatcher
- Pacific-slope flycatcher
- Allen's hummingbird
- Bewick's wren
- California thrasher
- Pallid bat
- Long-eared myotis
- Fringed myotis
- Big-scale balsamroot
- Diablo helianthella
- Large-flowered leptosiphon (linanthus)
- Oregon meconella
- Robust monardella

Lee's Micro-Blind Harvestman

This arachnid was first identified at LBNL in the 1960s and again in the 1980s. A site at LBNL on the south-facing slope of Blackberry Canyon has been identified as the type locality[8] for this harvestman species. The species is only known from one other occurrence in Claremont Canyon (Briggs and Ubick, 1989). A limited area of known habitat for this species at LBNL consists of a nearly closed canopy oak-bay woodland with undisturbed sandstone rocks that are embedded in the soil and that have moist conditions underneath (McClure, 2004; Ubick, 2003). The LBNL site was mapped for the 1997 SEIR so that this spider would not be disturbed as a result of vegetation management. In the 1990s, the species was identified, along with five other harvestman spiders, as a potential candidate for listing as endangered or threatened (USFWS, 1994). However, it has never been listed as such (USFWS, 2005a and 2005b) and is no longer proposed for listing (USFWS, 2005c), although several other harvestman species are now listed as species of concern. Lee's micro-blind harvestman is currently listed as a special animal by the state (CDFG, 2004); however, due to lack of information about the species, it has no official status. Although the species has no formal status, its known habitat at LBNL will continue to be protected from development by its designation as a fixed constraint under the 2006 LRDP.

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8 A species' *type locality* is the location from which the species was first collected and identified.

San Francisco Lacewing

The USFWS has designated the San Francisco lacewing, an insect formerly known throughout the Coast Ranges from Mendocino to Los Angeles, as a federal species of special concern due to its shrinking geographic range. This lacewing is known to inhabit coastal scrub and woodland habitat and is known to occur in Strawberry Canyon. The species is active from January through July, but little else is known about the species' biology or habitat preferences (Arnold, 1997). Implementation of the 2006 LRDP is not expected to affect this species, as impacts to native woodland or coastal scrub habitat under the LRDP would be minimal.

Alameda Whipsnake

Alameda whipsnake (*Masticophis lateralis euryxanthus*) is listed as threatened under both federal and state law and is found in open-canopied shrub communities, including coastal scrub and chaparral, and adjacent habitats including oak woodland/savanna and grassland areas (Swaim, 1994). Habitats adjacent to shrub communities may be crucial to Alameda whipsnakes, which remain in grassland habitats near shrub areas for up to several weeks at a time (USFWS, 2000). Other critical habitat elements for this species include rock outcrops and talus, where prey may be found and whipsnakes may find shelter, and small mammal burrows. Prey of the whipsnake include western fence lizard *(Sceloporus occidentalis)* as well as other snakes, frogs, small birds and mammals, and insects (Swaim, 1994). Alameda whipsnakes are most often found on east-to-southeast and south-facing slopes, where shrub cover is generally lower. Coastal scrub and adjacent habitats in the eastern and southern portions of the project site would be most likely to support this species (Swaim, 2006).

Cooper's Hawk

Cooper's hawk ranges over most of North America and may be seen throughout California, most commonly as a winter migrant. Nesting pairs have declined throughout the lower-elevation, more populated parts of the state. Cooper's hawk forages in open woodlands and wooded margins and nests in tall trees, often in riparian areas (Ehrlich et al., 1988; National Geographic, 1987; Baicich, 1997). This species has been observed foraging at LBNL (ESA, 2003b); coast live oak as well as conifers and eucalyptus may provide nesting habitat for the species at LBNL.

Sharp-Shinned Hawk

Sharp-shinned hawk occurs throughout most of North America and is a resident species throughout California. Although this species was not observed during site surveys, coast live oak and non-native conifers at LBNL may provide nesting habitat for sharp-shinned hawks (Ehrlich et al., 1988; National Geographic, 1987; Harrison, 1979).

Red-Tailed Hawk

Red-tailed hawks are commonly found in woodlands and open country with scattered trees. These large hawks feed primarily on small mammals, but will also prey on other small vertebrates, such as snakes and lizards, as well as on small birds and invertebrates. Red-tailed hawks nest in a variety of trees in woodland and agricultural habitats. Large coast live oaks at LBNL, as well as taller non-native trees such as eucalyptus and pine, may be used by red-tailed hawks for nesting. This species has been observed foraging at LBNL (ESA, 2002a-c; ESA, 2003a-c).

American Kestrel

American kestrel have been observed foraging in grassland habitat at LBNL (ESA, 2003b). This relatively small member of the falcon family preys on small birds and on mammals, lizards, and insects. The kestrel is most common in open habitats, such as grasslands or pastures. American kestrels usually nest in tree cavities (Sibley, 2001; Erlich et al., 1988); coast live oak and conifers at LBNL may provide this species with nesting habitat.

Great Horned Owl

Great horned owls occur throughout North America and are found in a variety of wooded habitats. These large raptors prey on small to medium-sized mammals such as voles, rabbits, skunks, and squirrels. Great horned owls can often be seen and heard at dusk, perched in large trees. They roost and nest in large trees such as pines or eucalyptus. They often use the abandoned nests of crows, ravens, or sometimes squirrels (Erlich et al., 1988; Sibley, 2000). Great horned owls may use large eucalyptus and pines located at LBNL for roosting or nesting and may forage over the grasslands on-site for voles and other small mammals.

Olive-Sided Flycatcher

Olive-sided flycatcher frequents a variety of forest and woodland habitats throughout most of California. Preferred nesting habitat includes coniferous and mixed hardwood-conifer forests. The species forages for insects over the forest canopy or adjacent grasslands and prefers tall conifers for both nesting and roosting. These flycatchers will often use the tallest trees in a locale for singing posts and hunting perches. Olive-sided flycatcher may make use of tall conifers and grasslands at LBNL for nesting and foraging purposes.

Pacific-Slope Flycatcher

Pacific-slope flycatcher nests locally in riparian or other moist habitat in woodlands and forests with dense canopy cover. This migrant may be found outside of riparian habitat in the non-breeding season; however, shade is an important habitat requirement during both nesting and migration. Potential nesting habitat for this species is located along the drainages at LBNL, and tall trees preferred for perching and foraging are present as well.

Allen’s Hummingbird

Allen’s hummingbirds inhabit chaparral, scrub, riparian, and woodland habitats that support nectar-producing plants. Insects and spiders are consumed as well. Trees and the dense coastal scrub habitat present at LBNL provide potential nesting and foraging habitat for Allen’s hummingbird.

Bewick’s Wren

Chaparral and scrub are the primary habitats for this insectivorous species, though riparian and woodland habitats with brushy understory, as well as urban landscaped areas, may also support

Bewick's wren. Nests are located in cavities on the ground, in trees, or in man-made structures. Dense, shrubby vegetation provides cover and protection from raptors and other predators during foraging activities. This species is most likely to occur and nest within willow scrub and coastal scrub habitats at LBNL.

California Thrasher

California thrashers are residents of moderate to dense chaparral and scrub habitats throughout California. Riparian thickets also may provide nesting habitat. This species rarely strays far from dense shrub cover during forays for terrestrial invertebrates and seeds. Shrub cover is also important for protection of the nest from predators such as domestic cats, skunks, and scrub jays. Riparian scrub and coastal scrub at LBNL may provide nesting habitat for California thrasher.

Pallid Bat

This species is found from Mexico north through Oregon and Washington into Canada, in a variety of habitats. Roosting occurs in deep crevices on rock faces, buildings, bridges and tree hollows (especially oaks). Pallid bat prey both aerially and terrestrially, on species such as Jerusalem crickets, moths, grasshoppers, June beetles and scorpions. Oak cavities may provide suitable roosting habitat on the LBNL.

Fringed Myotis

Fringed myotis occurs throughout California and is most frequent in coastal and montane forests and near mountain meadows (Jameson and Peeters, 1988). This species uses echolocation to find moths, beetles, and other prey and forms nursery colonies in caves and old buildings (Jameson and Peeters, 1988). Fringed myotis often use separate day and night roosts. Potential roosting habitat in the project area consists of peeling bark in eucalyptus or oak habitat.

Long-eared myotis

Long-eared myotis inhabits nearly all brushlands, woodlands, and forests, seeming to prefer coniferous forests and woodlands. Roosts include caves, buildings, snags, and crevices in tree bark. Caves provide night roosts. This species is highly maneuverable in its forays for arthropods over water, open terrain, and in habitat edges. Eucalyptus trees as well as oak woodland habitat in the project area may provide potential roosting habitat for long-eared myotis.

Special-Status Plants

A thorough review and analysis of special-status plant species, listed by the USFWS (2005), CDFG (2005), and CNPS (2005) databases as occurring in the project vicinity, indicate that the likelihood of adverse project impacts for most of the species listed is extremely low for the following reasons:

- Suitable habitat for the species either never existed on the project site or no longer exists due to historical and ongoing disturbance of soils and vegetation.
- The species is not documented within the general vicinity of the project site (i.e., the western side of the Oakland-Berkeley hills).

- Only historical occurrences for the species are documented from the area; or
- The species has been extirpated from the quadrangle or county.

Generally, the potential for special-status plant species to occur at LBNL is low; none have been observed in past environmental studies for LBNL, and none were observed during recent general biological resource surveys (ESA 2002a-c, 2003a-c). The site has been subject to ongoing disturbance, first in the form of grazing and then in the form of development, for the past 200 years. These types of disturbance, combined with the introduction of highly competitive non-native plant species, have resulted in the extirpation of a number of plant species that were documented in the Berkeley area in the late 1800s and early 1900s. In addition, the suppression of fire in the urbanized hills has resulted in mature stands of scrub and woodland with dense canopy cover and little understory. Since many herbaceous species tend to grow only in canopy openings in these habitat types, such species are unlikely to occur on the project site, as they can neither compete with the dense shrubs for soil moisture and nutrients nor obtain enough sunlight through the dense canopy. LBNL aggressively manages vegetation on virtually the entire hill site for fire protection. Through the reintroduction of grazing, as well as fuel reduction by mechanical means, LBNL has converted both coastal scrub habitat and stands of eucalyptus and French broom to grassland in recent years. Although small areas of patchily distributed native grasses remain scattered throughout LBNL, the native herbaceous species observed in these areas are those that are commonly found throughout the Oakland-Berkeley hills (ESA, 2002a-c, 2003a-c). Generally, rarer species in the hills tend to be found on serpentine or other ultramafic soils or on thin soils, such as occur in road cuts, where non-native species do not compete as readily. These types of soils were not observed at LBNL during ESA's field surveys.

The following grassland, coastal scrub, and woodland species were determined to have a moderate potential to occur on the project site, and are described below.

Big-scale balsamroot is a former federal species of local concern and a CNPS List 1B.2 species, which means it is considered rare, threatened or endangered in California. This yellow flowered perennial herb is a member of the daisy family and blooms from March through June. The species grows in woodlands and grassland openings, sometimes on serpentine soils and sometimes on other substrates.

Diablo helianthella is a relatively large herbaceous perennial (measuring 20 to 45 centimeters [8 to 18 inches] in height) that is a former federal species of concern and a CNPS List 1B.2 (rare, threatened or endangered in California) species. From April to May, this rock-rose produces bright, large, solitary, yellow flowers. This species occurs on grassy hillsides in valley grassland or foothill woodland habitat between 500 and 4,000 feet in elevation. It has been reported from Alameda, Contra Costa, San Mateo, and San Francisco Counties.

Large flowered leptosiphon (linanthus) is an herbaceous annual that is a former federal species of concern and is a CNPS List 4.2 species, meaning that it is considered of limited distribution and to be fairly endangered in California. This species occupies cismontane (on the west side of the Sierra Nevada) woodlands, valley and foothill grassland, and coastal scrub habitats and its showy white flowers may bloom from April through August.

Oregon meconella is a former federal species of concern and a CNPS List 1B.1 plant, which means that the species is rare, threatened, or endangered in California and elsewhere and considered seriously endangered in California. This member of the poppy family is an annual herb that blooms from March through April and inhabits coastal prairie as well as coastal scrub habitat.

Robust monardella is a former federal species of local concern and a CNPS List 1B.2 (rare, threatened or endangered in California) plant. A member of the mint family, this species can be found growing in clay or sandy soils in a variety of habitats, including coastal prairie, coastal scrub, and valley and foothill grassland.

IV.C.2.3 Special-Status Plant Communities

The CNDDB lists several sensitive natural communities, including northern maritime chaparral, serpentine bunchgrass, and valley needlegrass grassland, as occurring in the U.S. Geological Survey quadrangles searched. However, none of these communities, as described by Holland (1986), occurs on or in the vicinity of the project site. The CDFG considers riparian plant communities and freshwater marsh and seep communities in a generally arid climate to be sensitive habitat important to the species that depend on them.

IV.C.2.4 Sensitive Habitat

For the purposes of this EIR, the following habitats at LBNL were determined to be sensitive:

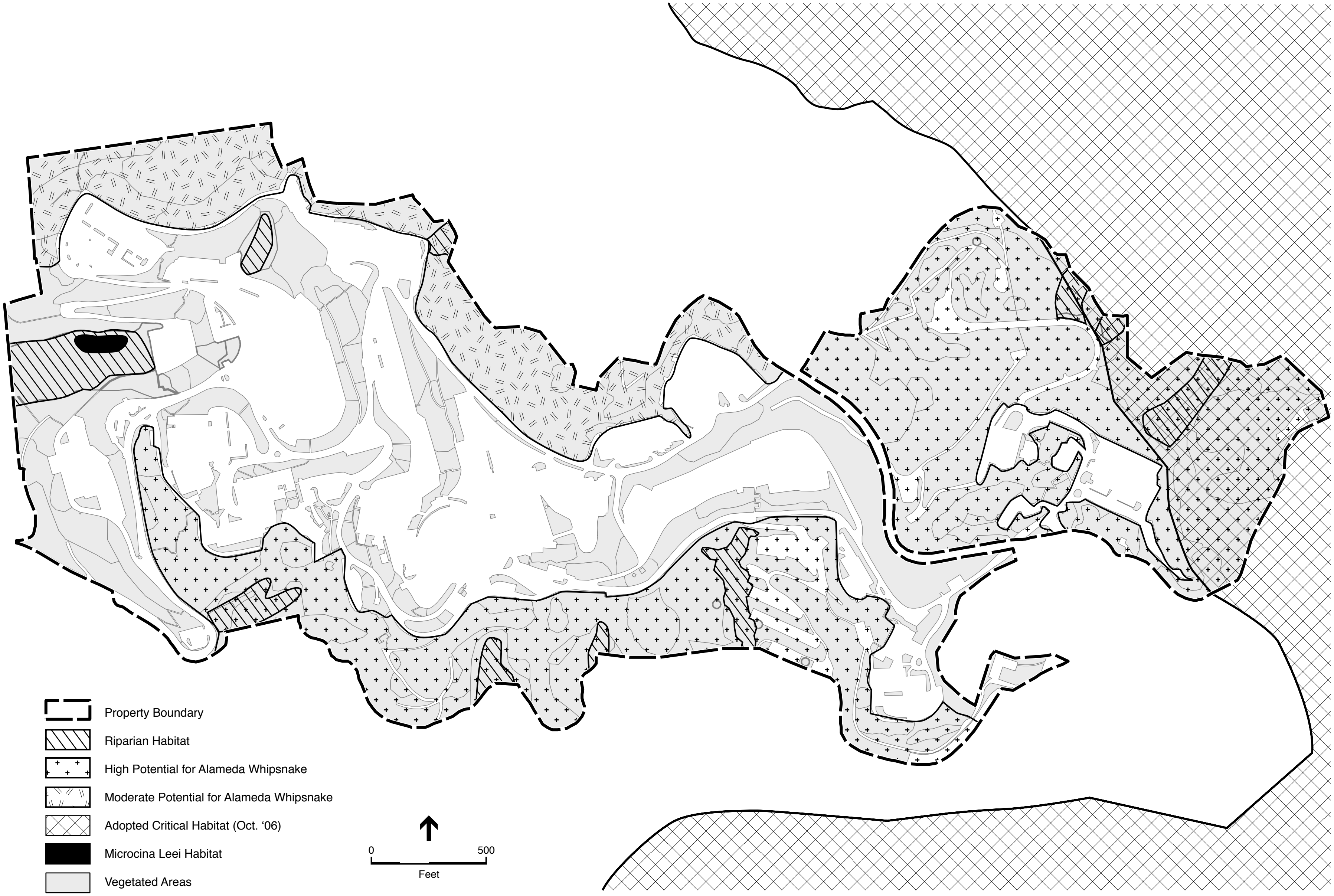
- Known habitat of Lee’s micro-blind harvestman (*Microcina leei*);
- Potential Alameda whipsnake habitat;
- Critical Alameda whipsnake habitat, as adopted by USFWS in October 2006;[9] and
- Riparian and wetland habitat that is potentially jurisdictional under federal or state law.

The locations of these habitats are shown on Figure IV.C-2.

IV.C.2.5 Waters of the United States and Waters of the State

As noted earlier, all of the drainages at LBNL are ephemeral or intermittent, except for the North Fork of Strawberry Creek and Chicken Creek. In total there are 13 potentially jurisdictional features present at LBNL that are potentially jurisdictional under Section 404 of the Clean Water Act, 33 U.S.C. §§ 1251, et seq. (see Figure IV.C-3, p. IV.C-24). These include reaches of the North Fork of Strawberry Creek, Chicken Creek, and the headwater tributaries to these creeks, as well several headwater tributaries to the South Fork of Strawberry Creek. All of these drainages have incised beds and banks and an ordinary high water mark and may be considered jurisdictional as “other waters of the U.S.” by the Army Corps of Engineers and as “waters of the state” by the CDFG. In addition, most of these drainages support a narrow corridor of riparian habitat, averaging approximately 25 feet from the top of each bank, that the CDFG might consider jurisdictional. Potentially jurisdictional features at LBNL include four freshwater seeps,

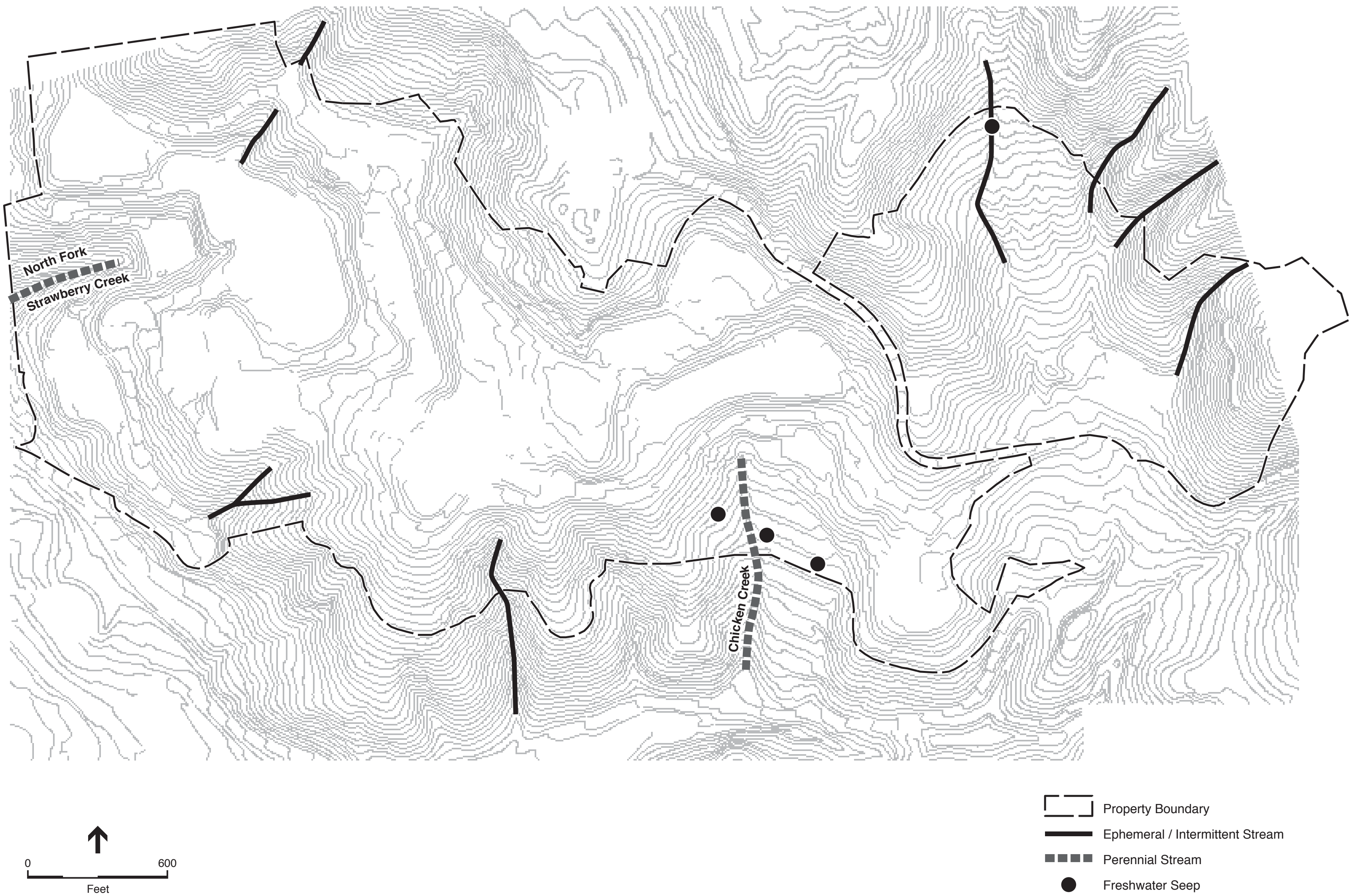
[9] See discussion under Impact BIO-5, p. IV.C-49.



SOURCE: LBNL; ESA (2006)

LBNL 2006 Long Range Development Plan . 201074

Figure IV.C-2
Sensitive Habitat at LBNL



SOURCE: ESA

LBNL 2006 Long Range Development Plan . 201074

Figure IV.C-3
Potentially Jurisdictional Waters at LBNL

which were described above under Plant Communities and Wildlife Habitat and are mapped on Figure IV.C-1 and Figure IV.C-3.

While some reaches of drainages at LBNL remain above ground, almost all drainage reaches have been culverted under developed areas. Ephemeral or intermittent drainages, especially upslope of the developed area culverts, have usually been significantly altered from their original states. These drainages may have rock energy dissipators to prevent erosion and/or sections of paved open channels. Often, their courses follow an artificial draw created as part of an earthmoving or fill project. Some flows are supplied solely by hydraugers. Culverting and an increase in impervious surfaces have created greater peak flows than existed under historical natural conditions. UC Berkeley has placed a detention basin on the Upper South Fork of Strawberry Creek to manage any increase in peak flows caused by development. Managing these peak flows in this manner prevents stream bank and bed erosion and consequent degradation of aquatic habitat along the main campus Strawberry Creek watershed course.

IV.C.2.6 Federal and State Regulatory Setting

Federal Regulations and Policies

The primary federal agency responsible for managing biological fish and wildlife resources in the area of LBNL is the USFWS.[10] The mission of the USFWS is to conserve, protect, and enhance the nation's fish and wildlife and their habitats for the continuing benefit of people. USFWS programs include management of wildlife sanctuaries, regulation of international and intrastate commerce related to wildlife, management of migratory species that move between states, wildlife management research, and identification and protection of endangered species.

Federal Endangered Species Act

Under the Federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce have joint authority to list a species as threatened or endangered (16 United States Code [USC] 1533[c]). Pursuant to the requirements of the FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed or proposed species may be present in the project region, and whether the proposed project would result in a "take" [11] of such species. The "take" provision of the FESA applies to actions that would result in injury, death, or harassment of a single member of a species protected under the Act. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under the FESA, or result in the destruction or adverse modification of critical habitat for such species (16 USC 1536[3][4]).

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10 The National Marine Fisheries Service (NMFS) also has responsibility for fisheries resources, but has no jurisdiction over upland areas where there is no stream access for anadromous fish, such as LBNL.

11 "Take," as applied in Section 9 of the FESA, means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or to attempt to engage in any such conduct." "Harass" is further defined by the USFWS (50 C.F.R. § 17.3) as an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, and sheltering. "Harm" is defined as "an act which actually kills or injures wildlife." This may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Substantial, adverse project-related impacts to FESA-listed species or their habitats would be considered significant in this EIR.

Proposed species are granted limited protection under the act and must be addressed in Biological Assessments (under Section 7 of the act); proposed species otherwise have no protection from "take" under federal law, unless they are emergency-listed species.[12] Candidate species are afforded no protection under the act. However, the USFWS recommends that candidate species and species proposed for listing also be considered in informal consultation during a project's environmental review.

Migratory Bird Treaty Act and Bald Eagle Protection Act

The federal Migratory Bird Treaty Act (16 USC, Section 703, Supplement I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. The act encompasses whole birds, parts of birds, and bird nests and eggs.[13]

The federal Bald Eagle Protection Act prohibits people within the United States (or other places subject to U.S. jurisdiction) from "possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or any golden eagle, alive or dead, or any part, nest or egg thereof."

Clean Water Act

The Federal Water Pollution Control Act of 1972, often referred to as the Clean Water Act, is the nation's primary law for regulating discharges of pollutants into waters of the United States. The objective of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The regulations adopted pursuant to the act deal extensively with the permitting of actions in waters of the United States, including wetlands. The act's statutory sections and implementing regulations provide more specific protection for riparian and wetland habitats than any other federal law. The U.S. Environmental Protection Agency (EPA) has primary authority under the Clean Water Act to set standards for water quality and for effluents, but the U.S. Army Corps of Engineers (Corps) has primary responsibility for permitting the discharge of dredge or fill materials into streams, rivers, and wetlands.

Draft Recovery Plan for Chaparral and Scrub Community Species

Under the FESA, the USFWS must prepare a recovery plan for listed species. A recovery plan details the actions needed to foster self-sustaining wild populations of listed species so they no longer need protection under the FESA. The USFWS published the *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay, California* ("Recovery Plan") in November 2002. This draft plan is habitat-based and covers six species of plants and

[12] Note, however, that protection from "take" begins at this stage under California law.
[13] The act covers hundreds of birds, including varieties of loon, grebe, albatross, booby. pelican, cormorant, heron, stork, swan, goose, duck, vulture, eagle, hawk, falcon, fail, plover, avocet, sandpiper, phalarope, gull, tern, murre, puffin, dove, cuckoo, roadrunner, owl, swift, hummingbird, kingfisher, woodpecker, swallow, jay, magpie, crow, wren, thrush, mockingbird, vireo, warbler, cardinal, sparrow, blackbird, finch, and many others.

animals that occur primarily in chaparral and scrub habitats of the East Bay. Potential habitat for two of these species, the Alameda whipsnake and the Berkeley kangaroo rat, occurs at LBNL. While this draft plan has not yet been adopted, it may be adopted in its current or modified form during the time period covered by the 2006 LRDP. UC Berkeley is identified as a major stakeholder in the recovery process. Should the plan be formally adopted, LBNL would be subject to the plan's requirements during any federal permitting process involving the Lab.

LBNL lands that were previously designated as part of a critical habitat unit for the Alameda whipsnake are now designated as part of Recovery Unit 6 for the species. The major threats to Alameda whipsnake in this recovery unit are fire suppression, presence of non-native plants and animals, and loss of habitat and habitat fragmentation due to urban development (USFWS, 2002). Elements of the recovery strategy for Unit 6 that may be relevant to LBNL include:

- Conservation of existing open space;
- Control of encroachment of invasive non-native plant species, such as eucalyptus and French broom; and
- Conduct of fuel management programs in such a way as to enhance or restore habitat for the whipsnake (e.g., reintroducing or mimicking natural disturbance regimes).

The Berkeley kangaroo rat is presumed extirpated (extinct) in the Oakland-Berkeley hills (USFWS, 2002). However, the recovery plan recommends that, if and when surveys are carried out in the plan area for Alameda whipsnake or other species that may occur in chaparral or scrub communities, habitat assessment for the kangaroo rat be included as well. If appropriate habitat with burrows and scat are present, then trapping surveys should be conducted to identify species using the burrows (USFWS, 2002).

State Regulations and Policies

The CDFG is the primary state agency responsible for managing biological resources. The mandate of the CDFG is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. In particular, the CDFG is required under various state statutes to conserve species through listing, habitat acquisition and protection, review of local land use planning, multi-species conservation planning, stewardship, recovery, research, and education.

California Endangered Species Act

Under the California Endangered Species Act (CESA), the CDFG has the responsibility for maintaining a list of threatened and endangered species (California Fish and Game Code Section 2070). The CDFG also maintains a list of "candidate species," which are species formally under review for addition to either the list of endangered species or the list of threatened species. In addition, the CDFG maintains lists of "species of special concern," which serve as watch lists. Pursuant to the requirements of the CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species could be present on the project site and determine whether the proposed project could have a potentially significant impact on such species. In addition, the CDFG encourages informal consultation on any proposed project that may affect a candidate species. Project-related impacts to species on the CESA endangered or threatened lists would be considered significant in this EIR. Impacts to “species of concern” would be considered significant if the species met the criteria set forth under CEQA Guidelines Section 15380, or if the species were also protected under any of the other statutes or policies discussed in this section.

California Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act (NPPA), which directed the CDFG to carry out the legislature’s intent to “preserve, protect, and enhance endangered plants in this state.” The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. The CESA expanded upon the original NPPA and enhanced legal protection for plants. The CESA established threatened and endangered species categories, and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, there are three listing categories for plants in California: rare, threatened, and endangered.

California Fish and Game Code

The California Fish and Game Code provides a variety of protections for species that are not federally or state-listed as threatened, endangered, or of special concern.

- Section 3503 protects all breeding native bird species in California by prohibiting the take,[14] possession, or needless destruction of nests and eggs of any bird, with the exception of non-native English sparrows and European starlings (Section 3801).
- Section 3503.5 protects all birds of prey (in the orders Falconiformes and Strigiformes) by prohibiting the take, possession, or killing of raptors and owls, their nests, and their eggs.
- Section 3513 of the code prohibits the take or possession of migratory nongame birds as designated in the Migratory Bird Treaty Act or any parts of such birds except in accordance with regulations prescribed by the Secretary of the Interior.
- Section 3800 of the code prohibits the taking of nongame birds, which are defined as birds occurring naturally in California that are not game birds or fully protected species.
- Section 3511 (birds), Section 5050 (reptiles and amphibians), and Section 4700 (mammals) designate certain wildlife species as fully protected in California.

Special-Status Natural Communities

Special-status natural communities are identified as such by CDFG’s Natural Heritage Division and include those that are naturally rare and those whose extent has been greatly diminished through changes in land use. The CNDDB tracks 135 such natural communities in the same way that it tracks occurrences of special-status species: information is maintained on each site’s location, extent, habitat quality, level of disturbance, and current protection measures. The CDFG

[14] “Take” in this context is defined in Section 86 of the California Fish and Game Code as to “hunt, pursue, catch, capture, or kill, or to attempt to hunt, pursue, catch, capture, or kill.”

is mandated to seek the long-term perpetuation of the areas in which these communities occur. While there is no statewide law that requires protection of all special-status natural communities, CEQA requires consideration of the potential impacts of a project to biological resources of statewide or regional significance.

Waters of the United States and Waters of the State

The term "waters" under both federal and State regulations (C.F.R. § 328.3[a]; 40 C.F.R. § 230.3[s]; California Water Code, Division 7, Chapter 2, § 13050 [e]) includes streams, rivers, lakes, ponds, wetlands, and sloughs as well as a variety of other water bodies and their tributaries.[15] Wetlands are ecologically productive habitats that support a rich variety of both plant and animal life. The importance of wetlands has increased due to their value as recharge areas and filters for water supplies and their widespread filling and destruction to enable urban and agricultural development. In a jurisdictional sense, there are two commonly used definitions of a wetland, one definition adopted by the Corps and a separate definition, originally developed by USFWS, which has been adopted by the agencies in the State of California that have regulatory authority over wetlands. Both definitions are presented below.

Federal Wetlands Definitions

Pursuant to Section 404 of the Clean Water Act, wetlands are defined as a subset of "waters of the United States." The term "waters of the United States," as defined in the Code of Federal Regulations (33 C.F.R. § 328.3[a]; 40 C.F.R. § 230.3[s]), refers to any of the following:

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

2. All interstate waters including interstate wetlands. (Wetlands are defined by the federal government [33 C.F.R. § 328.3(b)] as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.).

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:

   – which are or could be used by interstate or foreign travelers for recreational or other purposes; or
   – from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
   – which are used or could be used for industrial purposes by industries in interstate commerce.

15 The State definition includes groundwater as well.

4. All impoundments of waters otherwise defined as waters of the United States under the definition.

5. Tributaries of waters identified in paragraphs (1) through (4).

6. Territorial seas.

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6).

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA (33 CFR 328.3[a][8]).

Wetland determination under the federal wetland definition adopted by the Corps requires the presence of three factors: (1) wetland hydrology, as defined above under point 2; (2) plants adapted to wet conditions; and (3) soils that are routinely wet or flooded [33 C.F.R. § 328.3(b)].

State of California Wetland Definitions

Agencies with regulatory authority over wetlands in the State of California have several different wetland definitions. The Regional Water Quality Control Boards, which have the primary state authority over wetlands, use the same definition as the Corps (see above), since their regulatory authority rests in Section 401 of the Clean Water Act (33 C.F.R. § 1341[a]).

The CDFG has adopted the Cowardin et al. (1979) definition of wetlands used by the USFWS (California Fish and Game Commission, 1987):[16]

> Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface of the land or is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes (at least 50 percent of the aerial vegetative cover); (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Under normal circumstances, the federal definition of wetlands requires all three wetland identification parameters to be met, whereas the Cowardin definition requires the presence of at least one of these parameters. For this reason, identification of wetlands by the CDFG consists of the union of all areas that are periodically inundated or saturated, or in which at least seasonal dominance by hydrophytes may be documented, or in which hydric soils are present. The CDFG does not normally have direct jurisdiction over wetlands unless they are subject to jurisdiction under streambed alteration agreements or they support state-listed endangered species.

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[16] The California Coastal Commission uses yet another wetland definition that is based on the Cowardin definition.

Regulation of Activities in Jurisdictional Waters

The U.S. Army Corps of Engineers has primary federal responsibility for administering two key statutes regulating waters of the United States, including "other waters" and wetlands: (1) the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters"; and (2) the Clean Water Act (Section 404), which governs specified activities in "waters of the United States," including wetlands. The Corps requires that a permit be obtained if a project proposes placing structures within navigable waters (Rivers and Harbors Act) or placing dredged or fill material into waters of the U.S. below the ordinary high-water mark in non-tidal waters.

The State's authority in regulating activities in other waters and wetlands resides primarily with the CDFG and the State Water Resources Control Board (SWRCB). In addition, the California Coastal Commission has review authority for projects within its jurisdiction. The CDFG provides comment on Corps permit actions under the Fish and Wildlife Coordination Act. The CDFG is also authorized under the California Fish and Game Code, Sections 1600–1616, to enter into a Streambed Alteration Agreement with an applicant and develop mitigation measures when a proposed project would obstruct the flow or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams. The SWRCB, acting through the nine Regional Water Quality Control Boards, must certify (or issue a waiver) that a Corps permit action meets state water quality objectives (Section 401, Clean Water Act).

IV.C.2.7 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. This section summarizes relevant polices contained in both the Berkeley and Oakland General Plans, as well as other City of Berkeley and City of Oakland documents relevant to biological resources at LBNL.

Berkeley General Plan

City of Berkeley General Plan policies pertaining to natural resources that are relevant to implementation of the LBNL LRDP include the following:

> <u>Policy EM-28 Creeks and Watershed Management</u>: Whenever feasible, daylight creeks by removing culverts, underground pipes, and obstructions to fish and animal migrations.
>
> <u>Policy EM-28 Natural Habitat</u>: Restore and protect valuable, significant, or unique natural habitat areas.
>
> <u>Policy EM-30 Native Plants</u>: Use native tree and plant species to enhance ecological richness.

> Policy EM-31 Landscaping: Encourage drought-resistant, rodent-resistant, and fire-resistant plants to reduce water use, prevent soil erosion, improve habitat, reduce fire danger, and minimize degradation of natural resources.

> Policy EM-32 Inter-jurisdictional Coordination: Encourage efforts by neighboring jurisdictions and agencies, such as the East Bay Regional Parks District, University of California, Berkeley, and the Lawrence Berkeley National Laboratory, to restore historic coastal grasslands in the hill area to provide natural habitat and reduce fire danger in the area.

City of Berkeley Coast Live Oak Removal Ordinance

The Berkeley City Council adopted ordinances declaring a moratorium on the removal of coast live oak trees within the city (Ordinance No. 6321-N.S., as amended by Ordinance No. 6462-N.S and Ordinance No. 6550-N.S.). These ordinances prohibit the removal of any single-stem coast live oak with a circumference of 18 inches or greater, as measured at a distance of 4 feet above ground level, and the removal of any multi-stemmed coast live oak with an aggregate circumference of 26 inches or greater. Exceptions may be made if the tree poses a danger to people and/or property and the only reasonable solution is tree removal.

City of Berkeley Creek Ordinance

Title 17, Chapter 17.08 of the Berkeley Municipal Code, Preservation and Restoration of Natural Watercourses, establishes policies on the issuance of permits for culverting open creeks, the rehabilitation and restoration of open waterways, and the management of watersheds. The ordinance defines a creek as a "…naturally occurring swale or depression, which carries water either seasonally or year-round, and which appears as an aboveground creek on the Geological Survey Map and in the 1975 Berkeley creeks map prepared by the planning department to show the approximate undergrounding of the watercourse." The ordinance prohibits the filling, obliteration, obstruction, and interference with any natural watercourse in Berkeley, as well as the construction of structures within 30 feet of the centerline of a creek without a permit. The ordinance also prohibits the culverting or riprapping of a creek without a permit issued by the city engineer. No permit will be issued without the submittal of plans, and any work carried out under the permit must be supervised by the city engineer or his designee. A permit will not be granted if less destructive solutions are feasible. Such alternatives include clearing of debris within the creek channel; restoration of the creek to re-establish natural stream morphology, geometry, or channel roughness; removal of structures when feasible; and bank stabilization using bioengineering techniques.

Oakland General Plan

The Open Space, Conservation, and Recreation (OSCAR) Element of the City of Oakland General Plan was adopted in 1996. OSCAR policies pertaining to natural resources with relevance to implementation of the LBNL LRDP include the following:

> Policy CO-6.1: Protect Oakland's remaining natural creek segments by retaining creek vegetation, maintaining creek setbacks, and controlling bank erosion. Design future flood control projects to preserve the natural character of creeks and incorporate provisions for

public access, including trails, where feasible. Strongly discourage projects which bury creeks or divert them into concrete channels.

Policy CO-7.1: Protect native plant communities, especially oak woodlands, redwood forests, native perennial grasslands, and riparian woodlands, from the potential adverse impacts of development. Manage development in a way which prevents or mitigates adverse impacts to these communities.

Policy CO-7.3: Make every effort to maintain the wooded or forested character of tree-covered lots when development occurs on such lots.

Policy CO-7.4: Discourage the removal of large trees on already developed sites unless removal is required for biological, public safety, or public works reasons.

Policy CO-8.1: Work with federal, state, and regional agencies on an ongoing basis to determine mitigation measures for development which could potentially impact wetlands. Strongly discourage development with unmitigatable adverse impacts.

Policy CO-9.1: Protect rare, endangered, and threatened species by conserving and enhancing their habitat and requiring mitigation of potential adverse impacts when development occurs within habitat areas.

Policy CO-11.1: Protect wildlife from the hazards of urbanization, including loss of habitat and predation by domestic animals.

Policy CO-11.2: Protect and enhance migratory corridors for wildlife. Where such corridors are privately owned, require new development to retain native habitat or take other measures which help sustain local wildlife population and migratory patterns.

The following policy is from the Land Use and Transportation Element:

Policy W3.3: Native plant communities, wildlife habitats, and sensitive habitats should be protected and enhanced.

City of Oakland Tree Ordinance

Title 12, Chapter 12.36 of the Oakland Municipal Code provides protection to coast live oaks measuring 4 inches in diameter (12 inches in circumference) and to any other tree measuring 9 inches in diameter (28 inches in circumference), when measured at a height of 4 feet above grade. Protected trees may not be removed without a tree removal permit. Permits may be issued with conditions of approval that include, but are not limited to, the protection of any other protected trees in the vicinity of the tree(s) to be removed and replacement plantings. Replacement plantings are not required for the removal of non-native species when trees are removed for the benefit of remaining trees or when there is insufficient space for a mature tree of the species being considered. Replacement trees must be trees appropriate to the area: coast live oak, coast redwood, madrone, California buckeye, or California bay.

City of Oakland Creek Ordinance

Title 13, Chapter 13.16, City of Oakland Creek Protection, Storm Water Management, and Discharge Control Ordinance, provides a high level of protection for creeks within Oakland's city limits. The ordinance defines a creek as "…a watercourse that is a naturally occurring swale or depression, or engineered channel that carries fresh or estuarine water either seasonally or year-around." In addition, under the ordinance definition, a creek channel must be hydrologically connected to a waterway above or below a project site, and the channel must exhibit a defined bed and bank. A creek protection permit is required whenever work is to be undertaken on a creekside property. The ordinance prohibits, among other things, the discharge of concentrated stormwater or other modification of the natural flow of water in a watercourse, development within a watercourse or within 20 feet from the top of the bank, and the deposition or removal of any material within a watercourse without a permit. Depending on the type of activity being permitted, conditions of approval may include the submittal of a creek protection plan and/or a hydrology report, revegetation with native plant species, the use of soil bioengineering techniques for bank stabilization and erosion control, and implementation of stormwater quality protection measures. The following activities, among others, are typically not permitted:

- Removal of riparian vegetation
- Culverting or undergrounding of a creek
- Moving the location of a creek
- Structures spanning a creek
- Riprap, rock gabions, or concrete within the bed or on the creek banks

The City of Oakland Creek Protection Ordinance was adopted in 1997. The ordinance is currently undergoing a clarification and revision process, and new guidelines for implementation are being developed.

UC Berkeley Strawberry Creek Management Plan

The Strawberry Creek Management Plan was originally prepared in 1987. The streams that dissect LBNL's slopes represent a significant portion of the upper Strawberry Creek watershed. The plan contains recommendations on best management practices for the Strawberry Creek watershed to control nonpoint-source pollution and reduce degradation of water quality. LBNL's has its own best management practices related to non-point-source pollution and reduction of degradation of water quality.

UC Berkeley Management Plan for Strawberry and Claremont Canyons

In 1979, the University Committee on Conservation and Environmental Quality prepared the *Management Plan for Strawberry and Claremont Canyons* (Beatty, 1979). This plan details guidelines for the management of vegetation and wildlife, fuel levels, watercourses, recreation, and land use in the Strawberry and Claremont Canyon areas and provides vegetation and fuel management prescriptions. Guidelines relevant to activities that may occur under the LBNL LRDP include the following:

- The Strawberry Canyon area should be managed to promote those natural succession processes that will result in a mosaic of native vegetation types.
- As non-native tree stands become decadent, they should be evaluated individually for replanting or conversion to native habitat.
- Planting of native species should be carried out with stock propagated from local materials.
- Herbicides should not be used to remove unwanted vegetation.
- Further increases in impervious surfaces throughout Strawberry Canyon should be minimized.
- Culverts should be cleaned at the end of each summer and inspected and cleaned after each rainstorm throughout the rainy season.
- Road cuts and fill areas should be inspected for erosion and seeded with appropriate species if erosion is present.
- Stream channels should be inspected and cleaned up annually. Debris, including brush, tree branches, and garbage, that can be moved downstream during peak flows should be removed.

The plan also provides guidelines for management of the University's 300-acre Ecological Study Area, which was established in 1969 and which lies adjacent to LBNL along a portion of its southern perimeter. This area is set aside for field research and natural resource investigations as well as passive recreational use by the general public. Relevant guidelines for Ecological Study Area management contained in the plan include the following:

- A new boundary should be established that would reduce the Ecological Study Area by a 100-foot strip in areas where it is adjacent to residential areas and roads. This buffer would provide for a fuel management zone along the perimeter of the Ecological Study Area.
- Within the fuel management zone:
  - Fuel over 3 inches in diameter, with the exception of downed logs over 12 inches in diameter on bare soil, will be removed.
  - The density of shrubs and trees should be reduced within the fuel management zone to break up both horizontal and vertical continuity.
  - Low-growing tree branches should be pruned to eliminate fuel ladders.
  - Growth of annual vegetation within 6 feet of roads should be cut and removed each year at the end of the growing season.

The 2020 UC Berkeley LRDP incorporates three previously proposed expansions of the Ecological Study Area boundary, as well as a further expansion to extend the Ecological Study Area boundary west to the Field Station for Behavioral Research. The 2020 LRDP also adjusts the eastern boundary of the Ecological Study Area to align with the watershed divide separating Claremont and Strawberry Canyons.

IV.C.3 Impacts and Mitigation Measures

IV.C.3.1 Significance Criteria

Evaluation of potential project impacts on the biological resources of a site and its surroundings requires analysis of the individual elements of the project and how introduction of those elements (separately or collectively) would affect the existing resources of the site.

For the purposes of this EIR, implementation of the 2006 LBNL LRDP may have a significant effect on biological resources if it would exceed the following Standards of Significance, based on Appendix G of the CEQA Guidelines and the UC CEQA Handbook:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or USFWS;

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan; or

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

IV.C.3.2 Impact Assessment Methodology

Potential impacts resulting from implementation of the LBNL 2006 LRDP were evaluated using the following methods and sources:

- Review of existing resource maps and aerial photographs of the project site. Preparation of graphics including vegetative cover, potentially jurisdictional waters, and sensitive habitat areas.

- Multiple field surveys (ESA, 2002a-c; ESA, 2003a-c).

- A review of biological data presented in the CNDDB and the CNPS *Electronic Inventory of Rare and Endangered Vascular Plants of California*, and an official species list for the project area from the USFWS (2005).

- Review of standard biological references (e.g., Hickman, 1993; Zeiner et al., 1990; and Stebbins, 1985).

- Review of LBNL's 1987 LRDP and its associated environmental impact reports, as well as surveys and environmental documents associated with specific LBNL projects and programs.
- Review of other available literature regarding the natural resources of the area (e.g., Beatty, 1979; Charbonneau, 1987; McBride, 1974; and Swaim, 1994).

Once site surveys were completed and all sources reviewed, a list was prepared of special-status species that were observed or had the potential to occur due to the presence of basic habitat types. Species were then evaluated to determine their potential to occur. Species determined unlikely to occur are species whose known current distribution or range does not include the LBNL site, for whom specific habitat requirements (i.e., serpentine grasslands, as opposed to grasslands occurring on other soils) are not present, or that are presumed to have been extirpated from the project area or region. Species with low potential to occur are those for whom limited or marginally suitable habitat is present at LBNL, even though they have not been observed during general biological or focused surveys conducted at LBNL and/or the species may not be documented in the general vicinity. Species with moderate potential to occur are those for whom low to moderate quality habitat is present at LBNL and that may or may not be documented as occurring in the vicinity. A species was determined to have high potential for occurrence if moderate to high quality habitat is present at LBNL and the site is included in the documented range of the species. Species designated as observed are documented as having been observed at LBNL.

For the analysis presented below, impacts resulting from implementation of the 2006 LRDP were considered to be significant if they would:

- Have a substantial adverse effect on special-status species that were found to have moderate or high potential to occur and/or special-status species that have been observed at LBNL;
- Result in the fill of or otherwise cause degradation of potentially jurisdictional waters;
- Have a substantial adverse effect on areas designated as sensitive habitat in this EIR; or
- Otherwise exceed the significance criteria presented above.

Development projects proposed under the 2006 LRDP could disturb common wildlife species that exist within the proposed project area, including California mule deer, raccoon, striped skunk, and gopher snake. Animals within these habitats, such as small mammals and reptiles, could be temporarily displaced during habitat removal or subjected to noise and other human disturbances as well as to direct mortality. The amount of habitat for these animals permanently lost as a result of the project is insignificant compared to the amount of similar habitat present in the general vicinity. Habitat temporarily disturbed during project construction would be revegetated similar to pre-project conditions. Disturbances to common wildlife species that could occur with implementation of the 2006 LRDP would not meet any of the significance criteria listed above, and are therefore not discussed further in this impact section.

In addition to providing the environmental impact analysis for the LRDP, the analysis in this EIR will be used in connection with later approvals of specific activities pursuant to the LRDP. The

Lab will evaluate the impacts on biological resources of any later activity implemented pursuant to the LRDP and compare those impacts with the evaluation in this program EIR. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3). In addition, this determination regarding the extent of further review that is required will be based on the limitations on further use of this EIR imposed in response to the City of Berkeley comments, as described in Chapter I.

IV.C.3.3 2006 LRDP Principles, Strategies and LBNL Design Guidelines

2006 LRDP Principles and Strategies

The 2006 LRDP proposes four fundamental principles that form the basis for the Plan's development strategies provided for each element of the Plan. The one principle most applicable to the biological aspect of new development is to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP (see Chapter III, Project Description for further discussion, and see Appendix B for a full listing of principles, strategies and design guidelines). Development strategies set forth in the 2006 LRDP applicable to biological resources include the following:

- Protect and enhance the site's natural and visual resources, including native habitats, riparian areas, and mature tree stands by focusing future development primarily within the already developed areas of the site.
- Continue to use sustainable practices in selection of plant materials and maintenance procedures.
- Develop all new landscape improvements in accordance with the Laboratory's vegetation management program to minimize the threat of wildland fire damage to facilities and personnel.
- Utilize native, drought-tolerant plant materials to reduce water consumption; focus shade trees and ornamental plantings at special outdoor use areas.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development principles as each new project is developed.

Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provide the following specific planning and design guidance relevant to the biological resources related aspects of new development to achieve these design objectives:

- Projects or portions of projects which fall within the Rustic Landscape zones identified on the LRDP Landscape Framework Map shall provide new plantings consistent with this zone.
- Projects or portions of projects which fall within the Rustic Riparian Landscape zones identified on the LRDP Landscape Framework Map shall provide new plantings consistent with this zone.
- Projects or portions of projects which fall within the Ornamental Landscape zones identified on the LRDP Landscape Framework Map shall provide new plantings consistent with this zone.
- Minimize impacts of disturbed slopes.
- Create a cohesive identity across the Lab as a whole by following established precedents for new landscape elements.
- Minimize further increases in impermeable surfaces at the Lab

IV.C.3.4 Impacts and Mitigation Measures

Impact BIO-1: Development proposed under the 2006 LRDP would result in the permanent and/or temporary removal of some existing native and non-native vegetation. (Less than Significant)

New proposed development under the 2006 LRDP occurring in areas not subject to previous construction would result in an increase of impervious surfaces at LBNL by an estimated total of approximately 9.5 acres, with a corresponding permanent decrease in the extent of existing vegetation. In addition, development of new buildings and parking lots would result in the temporary removal of existing vegetation in association with excavation and grading, the construction of temporary access roads, and other related activities. Under the 2006 LRDP, development of new buildings, roads, and parking lots would be restricted to the proposed developable areas. Although they contain some undeveloped and/or vegetated spaces between or contiguous to development, these areas encompass primarily those portions of the Laboratory site that have been developed or otherwise disturbed in the past. The major vegetation types occurring in these areas are non-native grassland, eucalyptus and conifer stands, and landscaped areas. These vegetation types are dominated by non-native species and, while permanent loss of this vegetation could adversely affect common wildlife species locally, the impact to vegetation types that are common throughout the Oakland-Berkeley hills would be less than significant because of the existing abundance of these non-special-status species.

Incorporation of the LRDP Development Principles and Design Guidelines, as well as the following best practices currently undertaken by Berkeley Lab in connection with development projects, would further reduce the degree of the impact. Among these practices are the following. Revegetation of disturbed areas (not covered by active buildings or parking lots), including slope stabilization sites, using native shrubs, trees, and grasses is included as a part of all new projects to the extent feasible and in keeping with the Lab's vegetation management program. Invasive plant species and other undesirable plants, such as French broom, yellow star-thistle, and Italian thistle, are controlled as appropriate under the Laboratory's vegetation management program. Removal of native trees and shrubs is minimized and, to the extent feasible, the removal of large coast live oak and California bay trees is avoided. To the extent feasible, disturbance to the LBNL perimeter buffer zones (i.e., undeveloped and vegetated areas around the Lab perimeter, particularly those areas falling within the area designated as Perimeter Open Space) is avoided or minimized, particularly in areas that are contiguous with natural or otherwise undeveloped areas outside of Lab boundaries or within areas designated as having fixed constraints (i.e. riparian habitat). Additionally, to the extent feasible, LBNL minimizes activity and encroachment in Blackberry Canyon. To date, these practices have been effective or have made important contributions towards minimizing erosion and slope instability, controlling invasive plant species, minimizing the removal of native trees and shrubs, and in maintaining the vegetated areas along the Lab's perimeter with a minimum of disturbance.

Mitigation: None required.

Project Variant. Compared to the 2006 LRDP, the project variant would not result in any change in buildings or structures (including roads, parking lots, etc.) developed, and therefore impacts would be the same as those described for the proposed project, and would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of biological impacts. Potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario for previously undeveloped areas where native vegetation may remain include Buildings S-1, S-13, and S-15. Individual projects identified in the Illustrative Development Scenario that include a combination of previously developed as well as undeveloped areas include Buildings S-4, S-5, S-8, S-9, S-12, and S-14, as well as Parking Structures and Lots PS-2, PL-3, and PL-9 (along with Road 2). Development in these areas would result in removal of some existing native and non-native vegetation. For the reasons stated above, with incorporation of the LRDP Development Principles and Design Guidelines, as well as the above-noted best practices, implementation of these future projects under the LRDP would have a less-than-significant impact on native vegetation.

Impact BIO-2: Development under the 2006 LRDP could result in adverse impacts to drainages and/or wetlands subject to Corps and CDFG jurisdiction, including permanent or temporary fill,[17] and accidental discharges of fill materials or other deleterious substances during construction. (Significant; Less than Significant with Mitigation)

Implementation of the 2006 LRDP could result in adverse impacts to potentially jurisdictional waters, including drainages and wetlands, at LBNL. Any LRDP development project resulting in permanent or temporary fill of jurisdictional waters would most likely be subject to provisions of Sections 401 and 404 of the Clean Water Act and Sections 1600 through 1616 of the California Fish and Game Code. Such projects may qualify for authorization under a Nationwide Permit (NWP) from the Corps. The most likely applicable NWP for projects occurring under the LRDP would be Nationwide Permit 39, *Residential, Commercial, and Institutional Developments*. Although the qualifications vary by nationwide permit, under NWP 39, impacts to waters under the jurisdiction of the Corps must be less than 0.5 acre in area, and no more than 300 linear feet of intermittent or perennial stream may be filled in order to qualify for authorization. Even if these limitations are met, the Corps has discretion under certain circumstances to require an individual permit. When a project does not meet the criteria for a nationwide permit, an applicant must also apply for an Individual Permit. Under NWP 39, fill of greater than 300 linear feet of perennial stream would require an Individual Permit and fill of greater than 300 linear feet of intermittent stream would require an Individual Permit or a waiver of 300 foot limit from the Corps' district engineer, who must determine that the proposed activity otherwise complies with the terms and conditions of the Nationwide Permit and that adverse environmental effects are minimal both individually and cumulatively, and must waive the limitation in writing before the permittee can proceed with project implementation. In the event that the district engineer will not waive the fill limit, an Individual Permit would be required.

In addition, any project requiring Corps authorization would require a Section 401 Regional Water Quality Control Board certification or waiver and most such projects would also require a Streambed Alteration Agreement from the CDFG. These permits must be obtained prior to project implementation and would contain conditions of approval designed to minimize adverse effects on wetland resources. Acquisition of these permits is a regulatory requirement and is not considered in and of itself mitigation for loss of waters of the U.S. However, the processes for obtaining any state or federal wetlands permits involve the development of compensatory actions similar to CEQA-derived mitigation in scope and intent. In addition to the acquisition of necessary permits, implementation of the mitigation measures listed below (BIO-2a through BIO-2c) would serve to reduce potential impacts on jurisdictional waters to less-than-significant levels.

As described in detail in Section IV.G, Hydrology and Water Quality, LBNL currently employs, and would continue to employ, a wide array of construction-period "best management practices" to minimize the potential for accidental discharges of fill or other materials into jurisdictional waters. Active management of construction-related stormwater flows from development sites is a

[17] Fill is a technical term used by the Corps and defined as "any material placed in an area to increase surface elevation" (Wetland Training Institute, 1995).

standard part of contract specifications on all construction projects undertaken by LBNL. Construction projects incorporate control measures and are monitored to manage stormwater flows and potential discharge of pollutants. For example, LBNL's standard construction specifications include requirements for installation of erosion control netting and riprap to protect slopes and minimize adverse effects of runoff; protection of existing plant materials; application and maintenance of hydroseeding (sprayed application of seed and reinforcing fiber on graded slopes); no washout of concrete trucks to the storm drain system; and proper disposal of waste water resulting from vehicle washing. LBNL also implements spill prevention and response programs to minimize pollutants in runoff. Construction sites are replanted as soon as practicable following construction. In addition, the Lab's construction specifications require that contractors properly maintain construction vehicles to minimize fluid leaks and that contractors not refuel construction equipment in proximity to waterways. These ongoing programs would reduce the potential for accidental discharge during construction to adversely affect jurisdictional waters. In addition to the acquisition of necessary permits and employment of LBNL best management practices, implementation of the following mitigation measures (BIO-2a through BIO-2c) would reduce the potential impact on jurisdictional waters and accidental discharges of fill or other deleterious substances during construction to a less-than-significant level.

Mitigation Measure BIO-2a: Future development under the 2006 LRDP shall avoid, to the extent feasible, the fill of potentially jurisdictional waters. Therefore, during the design phase of any future development project that may affect potentially jurisdictional waters, a preliminary evaluation of the project site shall be made by a qualified biologist to determine if the site is proximate to potentially jurisdictional waters and, if deemed necessary by the biologist, a wetlands delineation shall be prepared and submitted to the Corps for verification.

Most development projected under the 2006 LRDP would have no potential for impacts on jurisdictional waters. However, development in specific locations including Buildings S-2 and S-0, as well as Parking Structures and Lots PS-1 and PL-9 and Roads R-2 and R-5, could require fill of or create the potential for accidental discharges to jurisdictional waters. It should be noted that the preferable form of mitigation recommended by the Corps is avoidance of jurisdictional waters. To the extent practicable, new development under the 2006 LRDP shall be located so as to avoid the fill of jurisdictional waters.

Mitigation Measure BIO-2b: Any unavoidable loss of jurisdictional waters shall be compensated for through the development and implementation of a project-specific Wetlands Mitigation Plan.

In the event that potential impacts to streams resulting from a 2006 LRDP development project are identified, compensation for loss of jurisdictional waters would be based on the Corps-verified wetlands delineation identified in Mitigation Measure BIO-2.a. During the permit application process for specific development project(s) with identified impacts on jurisdictional drainages or wetlands, LBNL would consult with the Corps, CDFG, and Regional Water Quality Control Board regarding the most appropriate assessment and mitigation methods to adequately address losses to wetland function that could occur as a result of the development project(s). A project-specific wetland mitigation plan would be developed prior to project implementation and submitted to permitting agencies for their approval. The plan may include one or more of the following mitigation options:

restoration, rehabilitation, or enhancement of drainages and wetlands in on-site areas that remain unaffected by grading and project development or off-site at one or more suitable locations within the project region; creation of on-site or off-site drainages or wetlands at a minimum of a 1:1 functional equivalency or acreage ratio (as verified by the Corps); purchase of credits in an authorized mitigation bank acceptable to the Corps and CDFG; contributions in support of restoration and enhancement programs located within the project region (such as those operated by local non-profit organizations including the Friends of Strawberry Creek, the Urban Creeks Council, or the Waterways Restoration Institute); or other options approved by the appropriate regulatory agency at the time of the specific project approval.

All mitigation work proposed in existing wetlands or drainages on- or off-site shall be authorized by applicable permits.

Mitigation Measure BIO-2c: To the extent feasible, construction projects that might affect jurisdictional drainages and/or wetlands could be scheduled for dry-weather months.

Avoiding ground-disturbing activities during the rainy season would further decrease the potential risk of construction-related discharges to jurisdictional waters.

Significance after Mitigation: Less than significant.

Project Variant. Compared to development pursuant to the 2006 LRDP, the project variant would not result in any change in buildings or structures developed, and therefore impacts would be the same as those described for the proposed project. With implementation of Mitigation Measures BIO-2a through BIO-2c, the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on jurisdictional drainages and/or wetlands. For the reasons stated above, construction of specific potential projects under the LRDP such as those identified in the Illustrative Development Scenario could adversely affect jurisdictional drainages and/or wetlands or result in accidental discharges. The above impact statement would also apply to the Illustrative Development Scenario and, with implementation of Mitigation Measures BIO-2a through BIO-2c, the impact on jurisdictional waters and from potential accidental discharges would be less than significant.

Impact BIO-3: Construction activities proposed under the 2006 LRDP could adversely affect special-status nesting birds (including raptors) such that they abandon their nests or such that their reproductive efforts fail. (Significant; Less than Significant with Mitigation)

The removal of large, mature trees within a future development project footprint as well as any unusually loud noise level generated by project construction activities have the potential to disturb nesting raptors or other special-status nesting birds using the trees, or to result in the destruction or abandonment of special-status bird nests, eggs, or fledglings. Cooper's hawk, a California species of concern, as well as red-tailed hawk and American kestrel, both of which are protected under Section 3503.5 of the California Fish and Game Code, have been observed foraging on-site and may nest at LBNL as well. Based on the presence of suitable habitat, a number of other bird species of concern (see Table IV.C-1, p. IV.C-10) should be considered as potentially present and possibly using the area for nesting purposes. Tree removal or tree pruning could result in the loss of active nests of the above-noted raptors, and possibly of nests of other special-status bird species identified in Table IV.C-1. This would constitute a significant adverse impact.

Ambient noise level in developed areas of the Lab is typically generated mostly by vehicle traffic, especially diesel trucks and the Lab's shuttle bus fleet (also diesel-powered), which circulates the Lab at 10-minute intervals throughout the day, as well as automobiles and motorcycles. Stationary sources, including heating, ventilating, and air-conditioning equipment associated with buildings, and other stationary equipment at the Lab, including pumps, generators, cooling towers, exhaust hoods, and machine shop equipment, also generate noise. Noise measurements taken in July 2003 and January 2004 indicate that hourly average noise levels at locations around the Lab range between 52 and 68 decibels (dBA, Leq[18]). Maximum noise levels measured were between 61 and 83 dBA, with the higher levels most likely the result of shuttle bus traffic on the hill.[19]

As stated in Section IV.I, Noise, noise levels associated with typical construction and demolition equipment (other than the noisiest equipment, such as a hoe-ram impact hammer) range from 74 to 77 dBA. Operation of multiple pieces of equipment typically results in noise levels a few decibels higher. While much of the available research on noise effects on wildlife focuses on longer-term effects related to disturbance from recreational users and military operations (e.g., snowmobiles in national parks, military aircraft overflights in wilderness areas), this analysis conservatively assumes that disturbances from construction and demolition noise could potentially result in the abandonment of special-status bird nests, eggs, or fledglings present in the trees adjacent to the site. On one hand, one source reports, in terms of effects of continuous noise on bird communities, "An increase of 10 dBA above background noise is probably acceptable in most situations" (Nicholoff, 2003). On the other hand, a 10-dBA increase in noise level is perceived by the human ear as a doubling in loudness, potentially causing an adverse response. Wildlife perception of noise appears to be generally more sensitive than that of humans; therefore, it is assumed for the purposes of this EIR that a 10-dBA increase in noise (a doubling

[18] Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements; Leq represents the constant sound level that would contain the same acoustic energy as the varying sound level.

[19] All noise readings were based on measurements 15 minutes in duration.

of loudness) over the existing maximum levels should be considered to be material for birds, as well as other wild animals. Under many circumstances involving demolition and construction in already developed areas of the Lab, construction-generated noise levels would not be expected to exceed ambient noise levels by 10 dBA or more. Additionally, these noise levels would not be continuous (i.e., an individual piece of construction equipment frequently operates for several minutes to an hour or two before stopping while equipment is repositioned, haul trucks depart, and so forth), and therefore such activities would not be considered sufficient to cause a significant impact on nesting special-status birds. In cases when particularly noisy equipment was employed, i.e., causing noise that would substantially exceed ambient noise levels in sensitive habitat areas nearby), noise impacts would have the potential to cause a significant adverse noise or vibration impact to wildlife. Project-specific noise analysis could be required for future projects to determine whether such impacts would occur. Whatever the noise and demolition activity levels on the project site, there would be no adverse effect to biological resources, and therefore no significant impact, so long as the project would not interfere with the successful nesting of raptors and other special-status birds.

In addition to CEQA impacts, any removal or destruction of active nests and any killing of migratory birds would violate the federal Migratory Bird Treat Act and/or the California Fish and Game Code, Sections 3500-3516. (As noted, raptors protected by Fish and Game Code Section 3503.5 are considered special-status species for the purposes of this EIR, and are therefore listed in Table IV.C-1.)

With implementation of Mitigation Measure BIO-3 below, project effects with regard to nesting birds would not result in a substantial adverse effect on special-status species, nor interfere substantially with the movement of any resident or migratory species or impede the use of native wildlife nursery sites, and therefore the effect would be less than significant. This measure would apply to all project sites where trees and shrubs suitable for nesting birds were present.

Mitigation Measure BIO-3: Direct disturbance, including tree and shrub removal or nest destruction by any other means, or indirect disturbance (e.g., noise, increased human activity in area) of active nests of raptors and other special-status bird species (as listed in Table IV.C-1) within or in the vicinity of the proposed footprint of a future development project shall be avoided in accordance with the following procedures for Pre-Construction Special-Status Avian Surveys and Subsequent Actions. No more than two weeks in advance of any tree or shrub removal or demolition or construction activity involving particularly noisy or intrusive activities (such as concrete breaking) that will commence during the breeding season (February 1 through July 31), a qualified wildlife biologist shall conduct pre-construction surveys of all potential special-status bird nesting habitat in the vicinity of the planned activity and, depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on nesting special-status nesting birds:

1. Pre-construction surveys are not required for demolition or construction activities scheduled to occur during the non-breeding season (August 1 through January 31).

2. If pre-construction surveys indicate that no nests of special-status birds are present or that nests are inactive or potential habitat is unoccupied, no further mitigation is required.

3. If active nests of special-status birds are found during the surveys, a no-disturbance buffer zone will be created around active nests during the breeding season or until a qualified biologist determines that all young have fledged. The size of the buffer zones and types of construction activities restricted within them will be determined through consultation with the CDFG, taking into account factors such as the following:

    a. Noise and human disturbance levels at the project site and the nesting site at the time of the survey and the noise and disturbance expected during the construction activity;

    b. Distance and amount of vegetation or other screening between the project site and the nest; and

    c. Sensitivity of individual nesting species and behaviors of the nesting birds.

4. Noisy demolition or construction activities as described above (or activities producing similar substantial increases in noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any breeding birds taking up nests would be acclimated to project-related activities already under way). However, if trees and shrubs are to be removed during the breeding season, the trees and shrubs will be surveyed for nests prior to their removal, according to the survey and protective action guidelines 3a through 3c, above.

5. Nests initiated during demolition or construction activities would be presumed to be unaffected by the activity, and a buffer zone around such nests would not be necessary.

6. Destruction of active nests of special-status birds and overt interference with nesting activities of special-status birds shall be prohibited.

7. The noise control procedures for maximum noise, equipment, and operations identified in Section IV.I, Noise, of this EIR shall be implemented.

Implementation of the above measures would mitigate for the possible loss of individual active nests and ensure significance thresholds are not exceeded. No mitigation is proposed for the general loss of bird habitat. In addition to the numerous trees and shrubs within the proposed developable areas that are suitable for nesting and not proposed for removal, suitable and more extensive nesting and foraging habitat for special-status birds is available within protected, undeveloped lands adjacent to LBNL in the UC Berkeley Strawberry Canyon Ecological Study Area and within one mile of LBNL at Tilden Park and Claremont Canyon Regional Preserve. The abundance and proximity of protected habitat similar in structure and composition suggests that population effects on these birds resulting from project activities would be minor. Therefore, based on the temporary nature of the tree removal (in general trees that are removed would be replaced per LBNL's revegetation policies), the availability of suitable nesting habitat outside the construction disturbance zone, and permanently protected habitat generally within the range of the species, proposed development projects allowed under the 2006 LRDP, with implementation of Mitigation Measure BIO-3 above, would not significantly affect habitat for nesting birds potentially occurring at LBNL.

Significance after Mitigation: Less than significant.

Project Variant. Compared to the LRDP, the project variant would not result in any change in buildings or structures developed, and therefore impacts would be the same as those described for the proposed project. With implementation of Mitigation Measure BIO-3, the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on special-status birds. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario could adversely affect nesting raptors or other special-status birds, and the above impact statement would also apply to the Illustrative Development Scenario. With implementation of Mitigation Measure BIO-3, impacts of potential future LRDP projects identified in the Illustrative Development Scenario on nesting raptors or other special-status birds would be less than significant.

Impact BIO-4: Removal of trees and other proposed construction activities during the breeding season could result in direct mortality of special-status bats. In addition, construction noise and human disturbance could cause maternity roost abandonment and subsequent death of young. (Significant; Less than Significant with Mitigation)

The USFWS lists a number of bat species as species of federal concern, due to nationwide declines in many bat populations. Special-status bats that may occur at LBNL include fringed myotis and long-eared myotis. Special-status bats may use crevices in exfoliating tree bark and/or hollow cavities in trees located at LBNL, as well as abandoned buildings. This type of bat behavior would be most likely to occur in perimeter areas of the site. With implementation of Mitigation Measure BIO-4 below, project effects with regard to bats would not result in a substantial adverse effect on special-status species, nor interfere substantially with the movement of any resident or migratory species or impede the use of native wildlife nursery sites, and therefore the effect would be less than significant. This measure would apply to all project sites where trees suitable for use as maternity roosts for bats are present.

> **Mitigation Measure BIO-4:** Project implementation under the 2006 LRDP shall avoid disturbance to the maternity roosts of special-status bats during the breeding season in accordance with the following procedures for Pre-Construction Special-Status Bat Surveys and Subsequent Actions. No more than two weeks in advance of any demolition or construction activity involving concrete breaking or similarly noisy or intrusive activities, that would commence during the breeding season (March 1 through August 31), a qualified bat biologist, acceptable to the CDFG, shall conduct pre-demolition surveys of all potential

special-status bat breeding habitat in the vicinity of the planned activity. Depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on breeding special-status bats:

1. If active roosts are identified during pre-construction surveys, a no-disturbance buffer will be created by the qualified bat biologist, in consultation with the CDFG, around active roosts during the breeding season. The size of the buffer will take into account factors such as the following:

    a. Noise and human disturbance levels at the project site and the roost site at the time of the survey and the noise and disturbance expected during the construction activity;

    b. Distance and amount of vegetation or other screening between the project site and the roost; and

    c. Sensitivity of individual nesting species and the behaviors of the bats.

2. If pre-construction surveys indicate that no roosts of special-status bats are present, or that roosts are inactive or potential habitat is unoccupied, no further mitigation is required.

3. Pre-construction surveys are not required for demolition or construction activities scheduled to occur during the non-breeding season (September 1 through February 28).

4. Noisy demolition or construction activities as described above (or activities producing similar substantial increases in noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any bats taking up roosts would be acclimated to project-related activities already under way). However, if trees are to be removed during the breeding season, the trees would be surveyed for roosts prior to their removal, according to the survey and protective action guidelines 1a through 1c, above.

5. Bat roosts initiated during demolition or construction activities are presumed to be unaffected by the activity, and a buffer is not necessary.

6. Destruction of roosts of special-status bats and overt interference with roosting activities of special-status bats shall be prohibited.

7. The noise control procedures for maximum noise, equipment, and operations identified in Section IV.I, Noise, of this EIR shall be implemented.

Significance after Mitigation: Less than significant.

Project Variant. Compared to the LRDP, the project variant would not result in any change in buildings or structures developed, and therefore impacts would be the same as those described for the proposed project. With implementation of Mitigation Measure BIO-4, the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on special bats. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario could adversely affect special-status bats, and the above impact statement would apply. For the reasons stated above, and with implementation of Mitigation Measure BIO-4, the impact of such projects on special-status bats would be less than significant.

Impact BIO-5: Implementation of the 2006 LRDP could result in take or harassment of Alameda whipsnakes. (Significant; Less than Significant with Mitigation)

There has never been a reported sighting of an Alameda whipsnake on the LBNL hill site or its immediate vicinity. Though habitat types and features used by Alameda whipsnakes may vary, home ranges typically are centered on areas of scrub habitats with open to partially open canopy, on south-, southeast-, east-, and southwest-facing slopes. Rock outcrops are important for protection from predators and as habitat for western fence lizards and other prey species (Swaim, 1994). However, recent surveys and studies undertaken elsewhere in the region have shown that Alameda whipsnake can be found in a wider variety of habitats than previously thought. For example, whipsnakes have been found in grasslands with very little scrub present, in coastal scrub with dense canopy cover, and in patches of scrub less than one-half acre in size (Swaim, 2003). These recent findings suggest the possibility that whipsnakes could be inhabiting, or disperse through, areas of the LBNL site where coastal scrub habitat occurs in a mosaic with other habitat types such as grassland or woodland. A recent whipsnake habitat assessment of the LBNL hill site (Swaim, 2005) found that potential whipsnake occurrence would be most likely in the easternmost portion of the Lab that is contiguous with open space to the north and east and along the south-facing slopes of Strawberry Canyon. Both of these areas are primarily open space with a mosaic of grassland, coastal scrub, riparian woodland, and stands of non-native trees and provide a potential dispersal corridor from areas identified as critical habitat for the species (USFWS, 2006) to areas of coastal scrub with potential suitability for the whipsnake.

The 2005 LBNL habitat assessment identified and mapped potential for Alameda whipsnake occurrence based on habitat types present and other factors, including habitat fragmentation and existing land uses. Areas designated as having high potential for whipsnakes were those that included relatively large patches of coastal scrub in a mosaic of other habitat types and that were contiguous with larger open space areas and known occupied habitat and/or proposed critical habitat. Based on these factors, these are areas where whipsnakes are considered to have a high potential to occur (Swaim, 2005). Areas designated as having moderate potential were those that contained smaller patches of scrub in a mosaic with other habitat types but where there was also a fairly significant degree of fragmentation and habitat degradation and a lesser degree of contiguity with larger areas of less disturbed potential habitat. These areas may support a small whipsnake population (Swaim 2005). The habitat assessment found that the whipsnake would not be expected to use the remainder of the site (i.e., existing highly developed areas) on any predictable basis (Swaim, 2005).

After conducting site visits during the summer of 2000, the USFWS determined that most of the LBNL site, including areas with existing facilities, should be excluded from its final critical habitat listing[20,21] (USFWS, 2000). The 2000 designation of critical habitat was rescinded in 2003 but a new critical habitat designation was proposed in 2005 and adopted in October 2006 that, similar to the 2000 designation, includes the easternmost portion of the LBNL site.[22] This area is designated as a fixed constraint under the 2006 LRDP. Based on the habitat assessment, areas with moderate to high potential for whipsnake occurrence were mapped as sensitive habitat in Figure IV.C-2 in this document and should be avoided to the extent feasible. With the exception of potential development in the eastern portions of the hill site, the majority of development proposed under the 2006 LRDP can be considered infill development and would not occur in or near areas that provide suitable habitat for the Alameda whipsnake or within areas proposed as critical habitat. Mitigation Measures (BIO-5a through BIO-5f) would be implemented as directed below at project sites located within areas identified as having moderate to high potential for whipsnake occurrence to ensure that the species is protected to the greatest extent possible during project construction (see Figure IV.C-2).

> **Mitigation Measure BIO-5a:** With the approval of the USFWS on a case-by-case basis, relocate any snake encountered during construction that is at risk of harassment; cease construction activity until the snake is moved to suitable refugium. Alternatively, submit a general protocol for relocation to the USFWS for approval prior to project implementation.

[20] Critical habitat for the Alameda whipsnake was rescinded by court order on May 9, 2003. For the purposes of this analysis, the concept is still relevant in that the designation of critical habitat implies a high likelihood of species' presence where critical habitat elements are found. Even though critical habitat has been rescinded, the species is still fully protected under the FESA. In addition, the USFWS (2002) published a draft recovery plan that includes the species, and areas that were formerly designated as critical habitat units are now designated as recovery units under the plan. Finally, critical habitat for the species was re-proposed in October 2005 (USFWS, 2005d) and, as adopted in October 2006 (USFWS, 2006), includes the easternmost portion of the Lab site.

[21] As noted in Chapter I, Introduction, because the LRDP is a University-mandated planning document, it is not subject to review under the National Environmental Policy Act (NEPA). NEPA review would be required for LRDP development projects subject to an authorization or decision by the U.S. Department of Energy or another federal agency. In such instances, consultation with the USFWS would be required prior to implementation of the LRDP, pursuant to Section 7 of the FESA. This consultation would likely be informal and consist of documentation presented to the USFWS by the federal lead agency for the project indicating that the development project would have no impacts on Alameda whipsnake or whipsnake habitat.

[22] The adopted critical habitat, while smaller than that proposed in 2005 (155,000 acres adopted, compared to 203,000 acres proposed), includes the same part of the Lab main site as included in the proposed critical habitat. Most of the 48,000 acres excluded from the adopted critical habitat are in eastern Contra Costa County, although smaller areas were excluded in the Easy Bay hills in western Contra Costa and southern Alameda counties.

Mitigation Measure BIO-5b: Conduct focused pre-construction surveys for the Alameda whipsnake at all project sites within or directly adjacent to areas mapped as having high potential for whipsnake occurrence. Project sites within high potential areas shall be fenced to exclude snakes prior to project implementation. This would not include ongoing and non-site specific activities such as fuel management.

Methods for pre-construction surveys, burrow excavation, and site fencing shall be developed prior to implementation of any project located within or adjacent to areas mapped as having high potential for whipsnake occurrence. Such methods would be developed in consultation or with approval of USFWS for any development taking place in USFWS officially designated Alameda whipsnake critical habitat. Pre-construction surveys of such project sites shall be carried out by a permitted biologist familiar with whipsnake identification and ecology (Swaim, 2002). These are not intended to be protocol-level surveys but designed to clear an area so that individual whipsnakes are not present within a given area prior to initiation of construction. At sites where the project footprint would not be contained entirely within an existing developed area footprint and natural vegetated areas would be disturbed any existing animal burrows shall be carefully hand-excavated to ensure that there are no whipsnakes within the project footprint. Any whipsnakes found during these surveys shall be relocated according to the Alameda Whipsnake Relocation Plan. Snakes of any other species found during these surveys shall also be relocated out of the project area. Once the site is cleared it shall then be fenced in such a way as to exclude snakes for the duration of the project. Fencing shall be maintained intact throughout the duration of the project.

Mitigation Measure BIO-5c: (1) A full-time designated monitor shall be employed at project sites that are within or directly adjacent to areas designated as having high potential for whipsnake occurrence, or (2) Daily site surveys for Alameda whipsnake shall be carried out by a designated monitor at construction sites within or adjacent to areas designated as having moderate potential for whipsnake occurrence.

Each morning, prior to initiating excavation, construction, or vehicle operation at sites identified as having moderate potential for whipsnake occurrence, the project area of applicable construction sites shall be surveyed by a designated monitor trained in Alameda whipsnake identification to ensure that no Alameda whipsnakes are present. This survey is not intended to be a protocol-level survey. All laydown and deposition areas, as well as other areas that might conceal or shelter snakes or other animals, shall be inspected each morning by the designated monitor to ensure that Alameda whipsnakes are not present. At sites in high potential areas the monitor shall remain on-site during construction hours. At sites in moderate potential areas the monitor shall remain on-call during construction hours in the event that a snake is found on-site. The designated monitor shall have the authority to halt construction activities in the event that a whipsnake is found within the construction footprint until such time as threatening activities can be eliminated in the vicinity of the snake and it can be removed from the site by a biologist permitted to handle Alameda whipsnakes. The USFWS shall be notified within 24 hours of any such event.

Mitigation Measure BIO-5d: Alameda whipsnake awareness and relevant environmental sensitivity training for each worker shall be conducted by the designated monitor prior to commencement of on-site activities.

All on-site workers at applicable construction sites shall attend an Alameda whipsnake information session conducted by the designated monitor prior to beginning work. This session shall cover identification of the species and procedures to be followed if an individual is found on-site, as well as basic site rules meant to protect biological resources, such as speed limits and daily trash pickup.

Mitigation Measure BIO-5e: Hours of operation and speed limits shall be instituted and posted.

All construction activities that take place on the ground (as opposed to within buildings) at applicable construction sites shall be performed during daylight hours, or with suitable lighting so that snakes can be seen. Vehicle speed on the construction site shall not exceed 5 miles per hour.

Mitigation Measure BIO-5f: Site vegetation management shall take place prior to tree removal, grading, excavation, or other construction activities. Construction materials, soil, construction debris, or other material shall be deposited only on areas where vegetation has been mowed.

Areas where development is proposed under the 2006 LRDP are subject to annual vegetation management involving the close-cropping of all grasses and ground covers; this management activity would be performed prior to initiating project-specific construction. Areas would be re-mowed if grass or other vegetation on the project site becomes high enough to conceal whipsnakes during the construction period. In areas not subject to annual vegetation management, dense vegetation would be removed prior to the onset of grading or the use of any heavy machinery, using goats, manual brush cutters, or a combination thereof.

Most of the above mitigation measures are based on avoidance measures developed in informal consultation with the USFWS during site surveys for the water tank and fire road realignment components of the LBNL Sitewide Water Distribution Upgrade project, which was located in the easternmost portion of LBNL. The incorporation of these mitigation measures into that project resulted in an informal determination by the USFWS that the Sitewide Water Distribution Upgrade project would not be likely to adversely affect Alameda whipsnake or its critical habitat (USFWS, 2000; LBNL, 2001a; Philliber, 2002).

The incorporation of these measures, including the measures identified above under Mitigation Measures BIO-5a for all project sites and BIO-5b and BIO-5c for sites within high potential areas, would reduce potential impacts resulting from implementation of projects under the LRDP to less-than-significant levels. Mitigation Measure BIO-5a is not necessary prior to LRDP project activities to reduce a potentially significant impact to a less-than-significant level, as a project could be halted until a whipsnake relocation plan was approved. However, LBNL intends to voluntarily enact this mitigation measure proactively to minimize potential project delays if whipsnake were encountered.

Significance after Mitigation: Less than significant.

Project Variant. Compared to the LRDP, the project variant would not result in any change in buildings or structures developed, and therefore impacts would be the same as those described for the proposed project. With incorporation of Mitigation Measures BIO-5a through BIO-5f, the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on the Alameda Whipsnake. Locations of buildings, configurations, uses, and other features of actual development may vary from the scenario. All development (demolition or construction) occurring within or directly adjacent to the areas mapped as having high to moderate potential for Alameda whipsnake occurrence in Figure IV.C-2 would incorporate the mitigation measures presented above. This development could include Illustrative Development Scenario buildings S-1, S-8, S-9, S-11, S-12, S-13, S-14, and S-15. Also included would be roads R-1, R-2, and R-5; parking lots PL-8, PL-9, and PL-10; and parking structure PS-2. For the reasons stated above, potential development in these areas could result in take or harassment of Alameda whipsnakes.

Mitigation Measures BIO-5a, BIO-5b, and BIO-5c(1) through BIO-5f would apply to projects that would occur within or directly adjacent to areas mapped as having high potential for whipsnake occurrence. This development would include, but not be limited to, development identified in the Illustrative Development Scenario as S-9, S-11, S-12, S-13, S-14, and S-15; R-1 and R-2; PL-8, PL-9 and PL-10; and PS-2.

Mitigation Measures BIO-5a, BIO-5c(2) through BIO-5f would apply to projects that would occur within or directly adjacent to areas mapped as having moderate potential for whipsnake occurrence. This development would include, but not be limited to, development identified in the Illustrative Development Scenario as S-1, S-8, and R-5. No mitigation would be required for development projects occurring in already highly developed areas.

With implementation of Mitigation Measures BIO-5a through BIO-5f as indicated above, the impact from potential individual projects under the LRDP such as those described in the Illustrative Development Scenario associated with potential take of Alameda whipsnake would not result in a substantial adverse effect on special-status species, nor interfere substantially with the movement of any resident or migratory species or impede the use of native wildlife nursery sites, and therefore the impact of such projects on the whipsnake would be reduced to a less-than-significant level.

Impact BIO-6: Project activities allowed under the LRDP, including facilities and road construction in areas designated for use as Research and Academic, Central Commons, and Support Services zones, as well as vegetation management activities in designated Perimeter Open Space, could result in the take of special-status plant species. Construction activities, as well as vegetation management activities, have the potential to disturb or result in mortality of these species or eliminate their habitat. (Significant; Less than Significant with Mitigation)

Although no special-status plants have been observed within the LBNL property to date (LBNL 1992, LBNL, 1994; LBNL, 1997; SAIC, 1994; ESA, 2002a, 2002b, 2002c; 2003a, 2003b, 2003c), the project site provides habitat for a number of special-status plant species with potential to occur in the area.

These species, their periods of identification, and their habitat are:

Species	Period of Identification	Habitat
Big-scale balsamroot	March–June	woodland and grasslands
Diablo helianthella	April–June	woodland, scrub, grasslands
Large-flowered leptosiphon (linanthus)	April–August	woodland, scrub, grasslands
Oregon meconella	March–April	scrub
Robust monardella	June–July	coastal prairie, scrub, grasslands

Floristic surveys have not been conducted recently during the period of identification for some of these sensitive plant species, and some of these species were not considered in previous surveys. The combined blooming period (or period of identification) for the above species is March through July. Prior to implementation of specific development projects under the LRDP, site floristic surveys should be conducted and timed to coincide with the bloom period for special-status species for which suitable habitat is present. The area designated as Open Space (see Chapter III, Project Description, Figure III-3) under the 2006 LRDP is currently managed under the Lab's existing Vegetation Management Plan, which is in the process of being updated. Briefly, this zone has been managed to minimize damage to the Lab's structures from wildland fire through the application of a variety of pruning, mowing, grazing, and habitat conversion techniques. The Lab's vegetation management would continue under the 2006 LRDP and is described in more detail in Chapter III, Project Description. Construction and vegetation management activities have the potential to result in adverse impacts on special-status plants at LBNL. Implementation of the following mitigation measures will reduce these potential impacts to less-than-significant levels.

Mitigation Measure BIO-6a: Floristic surveys for special-status plants shall be conducted at specific project sites where suitable habitat is present. Floristic surveys shall also be conducted in designated Perimeter Open Space. All occurrences of special-status plant populations, if any, shall be mapped.

Although no special-status plants have been observed at LBNL during past biological resource surveys, the distribution and size of plant populations often vary from year to year, depending on climatic conditions. Therefore, a baseline survey of all non-developed areas, including the designated Perimeter Open Space areas, where there is potential for future development or vegetation management activities, should be conducted in accordance with USFWS and CDFG guidelines by a qualified botanist during the period of identification for all special-status plants. During this initial survey, any special-status plant populations found, as well as areas with high potential for supporting special-status plants (i.e., less disturbed areas, rock outcrops and other areas of thin soils, areas supporting a relatively high proportion of native plant species) would be identified and mapped. Thereafter, surveys of Perimeter Open Space areas where ongoing vegetation management (i.e., active vegetation removal to minimize potential wildland fire damage to facilities and personnel) activities would be undertaken, and that are mapped as supporting or having potential to support special-status plant species, would be conducted in April and June every five years.

In those proposed LRDP development sites where suitable habitat is present for special-status species identified as having a moderate to high potential for occurrence (see Table IV.C-1, p. IV.C-10), protocol-level rare plant surveys would be conducted prior to construction. Surveys should be conducted during the periods of identification for all species under consideration at each applicable development site, the timing and scope to be directed by a qualified botanist. During the initial survey, any special-status plant populations found, as well as all areas with high potential for supporting special-status plants (i.e. less disturbed areas, rock outcrops and other areas of thin soils, areas supporting a relatively high proportion of native plant species) would be identified and mapped.

Mitigation Measure BIO-6b: Seeds or cuttings shall be collected from sensitive plant species found within developable areas and open space and at risk of being any adversely affected, or sensitive plants found in these areas shall be transplanted.

If special-status plants are found during floristic surveys and are at risk of being adversely affected, a qualified botanist working in conjunction with an expert in native plant horticulture, CNPS, and CDFG, would collect seeds, bulbs, and cuttings for propagation and planting in specific project revegetation efforts as well as restoration of native habitat within designated Open Space. Perennial species could be transplanted, if found in undeveloped locations that have a high likelihood for future development. Due to its unreliability, translocation alone should not be relied upon as a sole means of mitigation; however, healthy individuals of any special-status plant species should be transplanted to areas of suitable habitat that are protected in perpetuity. The relocation sites may be located either on or off the LBNL hill-site. If the areas for transplanting are located off-site, they should be within a 20-mile radius of the project site. Plants should be relocated to areas with ecological conditions (slope, aspect, microclimate, soil moisture, etc.) as similar to those in which they were found as possible. Existing plants could also be held in containers for specific post-project revegetation efforts on-site.

With implementation of Mitigation Measures BIO-6a and BIO-6b, effects on special-status plants due to development pursuant to the LRDP would not result in a substantial adverse effect on special-status species, nor have a substantial adverse effect on any riparian habitat or other sensitive natural community, and therefore the effect would be less than significant.

Significance after Mitigation: Less than significant.

Project Variant. Compared to the LRDP, the project variant would not result in any change in buildings or structures developed, and therefore impacts would be the same as those described for the proposed project. With implementation of Mitigation Measures BIO-6a and BIO-6b, the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts special-status plant species. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario could adversely affect special-status plant species. The above impact statement would also apply to the Illustrative Development Scenario, and the impact of a future project identified in the Illustrative Development Scenario on special-status plant species would be less than significant with implementation of Mitigation Measures BIO-6a and BIO-6b.

IV.C.3.5 Cumulative Impacts

This section evaluates whether implementation of the 2006 LRDP, in combination with other past, present, and reasonably foreseeable future LBNL and non-LBNL projects, would result in significant cumulative impacts on the biological resources examined in this EIR. This analysis includes the impacts of cumulative growth potentially resulting from implementation of the Berkeley and Oakland general plans and the implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects).[23]

The geographic context for analysis of cumulative impacts to biological resources includes the areas encompassed by the LBNL LRDP, the UC Berkeley LRDP, the City of Berkeley hills neighborhoods, hills areas north of Claremont Canyon included within the City of Oakland, and Tilden Regional Park, which is managed by the East Bay Regional Park District (EBRPD). These lands are contiguous and represent a continuum from relatively undisturbed wildlands to the wildland-urban interface to downtown urban land uses. They are connected by riparian corridors and areas of open space.

This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.C -36) and, if so, whether the contribution of the LRDP to this impact would be

[23] The EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) found that those projects would not result in any adverse biological impacts, and thus the SCIP would not contribute to any cumulative impacts (UC Berkeley, 2006).

considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact BIO-7: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding (primarily residential) development in the Oakland-Berkeley hills, would contribute to a reduction of open space and, consequently, habitat for native plants and wildlife, including special-status species. (Less than Significant)

Projects considered under the 2006 LBNL and 2020 UC Berkeley LRDPs, as well as residential development taking place under the Berkeley and Oakland general plans within the geographic context outlined above, would combine to reduce open space and available habitat for both common and special-status wildlife and plants. However, open space currently comprises a significant portion of the geographic context for cumulative impacts analysis in this section. The majority of the LBNL hill site and the UC Berkeley Hill Campus are currently in open space, as is the vast majority of Tilden Regional Park. New development occurring under the Berkeley or Oakland general plans in the area would primarily be considered infill in areas zoned as residential and there are no large developments pending in the area under these plans. The East Bay Regional Park District currently has no plans for large facilities development or reductions in open space at Tilden Park. Implementation of the LBNL LRDP would result in the development of approximately 9.5 acres of available open space and habitat at the site. Implementation of the UC Berkeley 2020 LRDP could result in the development of less than 5 acres of existing open space in the Hill Campus. Therefore, growth under these plans would not result in a substantial reduction in open space or wildlife habitat and this impact is considered to be less than significant.

The magnitude of cumulative effects of development on biological resources is in large part determined by the extent to which resources are protected in plans and during specific project implementation. The LBNL and UC Berkeley LRDPs, as well as the East Bay Regional Park District's Master Plan and the City of Oakland and City of Berkeley general plans, all contain policies and guidelines for protecting natural resources, including special-status species, sensitive natural communities, and jurisdictional waters. All development under the LBNL and UC Berkeley LRDPs and any development under the East Bay Regional Park District's Master Plan would also take place in a regulatory context of federal, state, and local laws that combine to avoid and minimize impacts to special-status species, sensitive natural communities, jurisdictional waters, and wildlife migratory corridors and nurseries through a variety of tools including the creation of resource-specific management plans and the application of mitigation measures. Mitigation measures and best management practices applied to specific projects would help to ensure that they would not result in substantial adverse impacts to biological resources. Therefore, cumulative impacts to biological resources resulting from the proposed LBNL 2006 LRDP and the other projects considered in this section would be less than significant.

Mitigation: None required.

Project Variant. The project variant would result in traffic impacts substantially similar to the biological resources impacts that would result from the 2006 LRDP development. The cumulative biological resources impacts of the project variant would therefore be less than significant as described above.

Individual Future Project/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. A future project under the LRDP such as conceptually portrayed in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development, would, for the reasons stated in the impact statement above, result in cumulative biological resources impacts that would be less than significant.

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IV.D. Cultural Resources

IV.D.1 Introduction

This section evaluates the potential impacts on cultural (historical and archaeological) resources that could result from implementation of the proposed 2006 LRDP for the LBNL.

A summary of site history is presented using information from technical studies prepared for the project area. These technical studies include archival research at the California Historical Resources Information System's Northwest Information Center completed on December 1, 2003; a cultural resources evaluation and survey completed by Archaeological Research Services in 1986; an archaeological survey report (Kielusiak, 2000); and the first of a series of reports being prepared by D.W. Harvey (2003) of the Pacific Northwest National Laboratory as part of an inventory and evaluation of potential historically significant buildings and structures at Berkeley Lab.

IV.D.2 Setting

IV.D.2.1 Regional and Local Context

Early Regional and Local History

The beginning date for the prehistoric Native American occupation of Northern California is generally agreed to be about 2,000 B.C., at least in the San Francisco Bay region. Linguistic evidence suggests that the Native Americans that lived in the area spoke Chochenyo, one of the Costanoan[1] languages. In 1770, the Costanoan-speaking people lived in approximately 50 separate and politically autonomous nations or tribelets. Early Spanish diaries record a number of small villages along the foothills of the East Bay area. Ethnographic sources indicate that one settlement, named Huchiu-n, may have been situated in the general vicinity of the present city of Berkeley (Kroeber, 1925). During the mission period, 1770-1835, the Costanoan people experienced cataclysmic changes in almost all areas of their life, particularly a massive decline in population due to introduced diseases and declining birth rate. Following the secularization of the missions by the Mexican government in the 1830s, most Native Americans gradually left the missions to work as manual laborers on the ranchos that were established in the surrounding areas. Native American archaeological sites in this portion of Alameda County tend to be situated along ridgetops, midslope terraces, alluvial flats, near ecotones,[2] and near sources of water including springs.

In 1820, Sergeant Luis Peralta obtained Mission San Antonio, the present-day sites of the cities of Oakland, Berkeley, and Alameda. The land was later (in 1842) divided among his four sons. In

[1] "Costanoan" is derived from the Spanish word Costanos meaning "coast people." No native name of the Costanoan people as a whole existed in prehistoric times as the Costanoan were neither a single ethnic group nor a political entity.

[2] An "ecotone" is defined as the zone of transition between adjacent ecological systems, having a set of characteristics uniquely defined by space and time scales and by the strength of interactions between them.

1860, the University of California was established as the College of California on 160 acres, and in 1864 a Homestead Association was established in the adjacent areas. This led to increased development in the vicinity of the university and incorporation of the town of Berkeley in April 1878. During this time, the present-day LBNL site was largely undeveloped, and remained so until the late 1930s.

Development of Lawrence Berkeley National Laboratory

Lawrence Berkeley National Laboratory was founded in 1931 as the University of California Radiation Laboratory on the UC Berkeley main campus. The Radiation Laboratory (the former Civil Engineering Test lab) was established as an accelerator laboratory by UC President Robert Gordon Sproul for physics professor Ernest Orlando Lawrence. A couple of years earlier (in 1929), on the UC Berkeley campus, Lawrence had built the world's first cyclotron, a 4-inch circular particle accelerator. With the establishment of the Radiation Laboratory, Lawrence and his associates had the opportunity to expand their research.

In 1939, Lawrence was awarded the Nobel Prize in Physics for the invention and development of the cyclotron, in recognition of the importance of his research and its effect on the field of physics and in the production of artificial radioactive elements. As the scale and scope of the Radiation Laboratory's experiments grew, additional space was needed and, in 1940, the first building was constructed on the present-day LBNL site to house the next-generation, 184-inch cyclotron (Building 6). Further expansion of the physical size of the Laboratory's hill site during World War II was partly due to an increase in nuclear fission research, which prompted the need for higher-energy accelerators and more room for locating them. Growth of the hill site is also attributed to the fame and publicity Lawrence received for the Nobel Prize, which helped to attract research funding.

During the 1950s and 1960s, research growth and development at the Lab was guided mainly by high-energy physics research. Buildings constructed at the LBNL hill site were associated with the 184-inch cyclotron and other accelerators, including research labs, craft and maintenance shops, and offices. The Bevatron, completed in 1954 at the hill site, was the Laboratory's largest accelerator at the time and the nation's leading high-energy physics facility. It "was in the vanguard of physics research because of its capacity to generate the highest energies produced by an accelerator of that period. The Bevatron was the most powerful accelerator in the world from 1954–1959, and dominated the field of high-energy physics until the early 1960s" (Harvey, 2003). (See further discussion of the Bevatron under "Potential Historical and Archaeological Resources" below.)

The Heavy Ion Linear Accelerator, or HILAC, located in Building 71, opened in 1957 and was one of the first accelerators built specifically for the study of heavy ions (ions heavier than helium). The HILAC underwent several modifications and upgrades during the 1960s to become the SuperHILAC. Several chemical elements were discovered in Building 71 research labs, including nobelium (102) and seaborgium (106). The 88-Inch Cyclotron (Building 88) was built between 1958 and 1962. It was used for heavy ion research and was one of the new generations of sector-focused cyclotrons built after 1960.

The late 1960s through the early 1970s was a period of reduced program activity at LBNL. Following 1973 and the oil embargo, the Lab's activities began to diversify, although the Lab still retained its importance in high-energy and nuclear physics research. In 1974 "the Bevatron was combined with the HILAC to form the Bevalac and the Laboratory regained its position as a world-leading accelerator facility, this time for heavy-ion nuclear physics research" (Harvey, 2003). By the late 1970s, multi-program research efforts at LBNL were divided into nine research divisions with the following major programs: Accelerator and Fusion Research, Applied Science (energy and environment), Biology and Medicine, Chemical Biodynamics, Computing, Earth Science, Materials and Molecular Research, Nuclear Science, and Physics. At present, the Laboratory includes 18 divisions organized within the areas of Computing Sciences, Physical Sciences, Energy Sciences, Biosciences, General Sciences, and Resources.

By 1980, 25 percent of the Laboratory's activity was in high-energy and nuclear physics, down from 75 percent 10 years earlier. The Laboratory had become a multi-program national lab, with more emphasis on basic energy sciences and life sciences, while maintaining historically important roles in high-energy and nuclear physics. The Advanced Light Source accelerator, housed under the dome of the 184-Inch Cyclotron, was completed in 1993. This accelerator and electron storage ring produce the world's brightest soft x-ray and ultraviolet light.

The most notable accomplishments by LBNL scientists since the 1930s include:

- Invention of the Alvarez linear accelerator, and the proton synchrotron;
- Receipt of ten Nobel Prizes;
- Identification of over a dozen new chemical elements, including plutonium;
- Establishment of one of the world's major centers of heavy ion nuclear physics research;
- Operation of the SuperHILAC, Bevalac, and 88-inch cyclotron accelerators as national facilities for nuclear physics and biomedical research;
- Founding of the science of nuclear medicine;
- Contributions to discoveries and developments in high-energy physics;
- Invention of the chemical laser;
- Discovery of the first antiproton and antineutron;
- COBE satellite recordation of the seeds of the early universe;
- Human Genome Project, in which the Lab was named one of two DOE centers for mapping and sequencing human genome;
- Discovery of "dark energy" by the Supernova Cosmology Project;
- Superconducting magnet that breaks the TESLA record;
- Identification of good and bad cholesterol; and
- Development of the Extra Cellular Matrix theory that links breast cancer development to the breakdown in the micro-environment surrounding breast cells.

Appendix I contains a list of the Lab's achievements that the Lab prepared to mark its 75th anniversary in 2006.

IV.D.2.2 Potential Historical and Archaeological Resources

Previous Studies

Site-Wide Studies

As part of the environmental analysis for the 1987 LRDP EIR, as amended,[3] all undeveloped land and then-proposed building locations were examined for potential historical and archaeological resources. All reasonably accessible parts of the LBNL area were examined. Special attention was given to areas of relatively flat land or rock outcrops. The steep hillsides were not examined intensively, although transects were made through accessible areas. Based on the findings of the historic and archaeological resources survey, no indications of historic or prehistoric archaeological resources were encountered in any location at the project site. The 1987 LRDP EIR, as amended, included the analysis of four facilities at LBNL for potential eligibility for listing on the National Register of Historic Places. The Department of Energy (DOE), in consultation with the State Historic Preservation Officer, determined that only one of these facilities, Building 51 "the Bevatron" (and Building 51A), was eligible for listing on the National Register of Historic Places. An EIR evaluating the proposed demolition of Building 51 is currently anticipated to be considered for certification in early 2007.

EIR on Demolition of Building 51 Complex (the Bevatron)

DOE has proposed to demolish the Bevatron and the structure housing it, Building 51, at Berkeley Lab. During its operation from 1954 until 1993, the Bevatron was among the world's leading particle accelerators, and during the 1950s and 1960s, four Nobel Prizes were awarded for work conducted in whole or in part there. The Bevatron is approximately 180 feet in diameter. Building 51 is a large (approximately 126,500-gross-square-foot) shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop, and office functions. Since the end of the Bevatron's operations in 1993, Building 51 has had limited use for equipment storage, office space, and dry laboratories.

The Bevatron and Building 51 are no longer needed by LBNL. The Bevatron has not operated since 1993 and is non-functional. The Building 51 structure housing the Bevatron is deteriorating and consumes disproportionate maintenance resources. It does not meet current building codes, the roof leaks in several locations, and portions of the structure do not comply with current seismic design standards. In addition, removal of the building and its contents would free up the site for future development. However, while development of the site is likely at some point in the future, at this time there are no firm plans for future development that have reached the level of a proposed or reasonably foreseeable action.

The project site is approximately four acres in size, including parking and staging areas. Of this total, approximately 2.25 acres would be converted from developed area (i.e., occupied by Building 51) to an undeveloped area for an indeterminate time, until another project is proposed,

[3] The 1987 LRDP EIR, as amended, refers to the 1987 LRDP EIR and the subsequent environmental documents that permit incremental growth at LBNL, including the 1992 Supplemental Environmental Impact Report (SEIR) and the 1997 SEIR Addendum for the Proposed Renewal of the Contract Between the United States Department of Energy and The Regents of the UC for the Operation and Management of the Lawrence Berkeley Laboratory.

approved, and initiated. Under the proposed project, the concrete shielding blocks that surround the Bevatron would be removed, the Bevatron apparatus would be disassembled, Building 51 and the shallow foundation underneath the building demolished, and the resulting debris and other materials removed. The site would then be backfilled, and the fill compacted and leveled. The duration of the physical work for the project may vary from three and a half to seven years, and the work is currently anticipated to start in early 2008 (if the demolition is approved), and contingent upon funding and results of material sampling. For the purposes of conservative impact assessment, where impacts presumably are intensified in a shorter project timeframe, the project is assumed to take place over a three-and-one-half–year period.

Approximately half of the materials that would be removed would consist of non-hazardous debris and other items typical of building demolition projects. Hazardous waste, low-level radioactive waste, and mixed waste also would be shipped from the site. The project would seek to reuse or recycle materials (e.g., uncontaminated metals and concrete) where feasible. Items that could not be reused or recycled would be handled and disposed in accordance with applicable policies and regulations. An estimated maximum of about 4,700 one-way truck trips to ship items off-site, and to bring in such things as equipment and fill material for bringing the site back to a level condition, would be required over the course of the project. A maximum of about 50 temporary workers would be used by the project at any one time.

The EIR on the Building 51 project concludes that the Bevatron demolition would not result in any significant impacts that could not be mitigated to less-than-significant levels through implementation of mitigation measures included in the 1987 LRDP EIR, as amended, and/or project-specific mitigation measures, except for the significant unavoidable impacts on historic resources resulting from the demolition. Mitigation measures for potential environmental impacts of the project include conducting pre-demolition special-status avian and bat surveys and restricting the frequency of truck trips (loaded or empty) to a maximum of (a) one every 10 minutes (six truck trips per hour) during the a.m. and p.m. peak commute hours, and (b) one every five minutes (12 truck trips per hour) during periods other than the a.m. and p.m. peak commute hours.

Current Studies of Historical Resources

To evaluate the potential for historically significant buildings or structures at the Lab, LBNL has retained the Pacific Northwest National Laboratory team of licensed cultural resource professionals to conduct field surveys and historic research at LBNL. In coordination with LBNL, DOE, and the State Office of Historic Preservation, the team is systematically investigating and reporting on all buildings and structures at the Lab. The team will complete a series of reports to identify, survey, and evaluate approximately 245 buildings and structures at the LBNL site for potential eligibility for listing in the National Register. These studies have been undertaken pursuant to Section 110 of the National Historic Preservation Act, which requires that federal agencies, such as DOE, survey the lands under their control and evaluate all historic properties (including buildings and the equipment contained therein) for eligibility for listing in the National Register. These reports will then be submitted to the State Historic Preservation Officer for concurrence. Approximately 150 of the Lab’s 245 buildings have been investigated thus far.

The results of this ongoing work indicate that, among the structures analyzed thus far, the Building 51 and 51A "Bevatron" complex was the only structure considered eligible for listing in the National Register of Historic Places. The complex was therefore also included as eligible in the California Register of Historical Resources. For background, see discussion of the National Register of Historic Places and State Office of Historic Preservation under "Federal and State Regulatory Environment" below.

In accordance with the National Historic Preservation Act and a 1997 Memorandum of Agreement (MOA) among DOE, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation, LBNL prepared an Historic American Engineering Record (HAER) report for the Bevatron, a subatomic particle accelerator located in Buildings 51 and 51A (LBNL, 1997).[4] The HAER included a written historical and architectural description of the building and accelerator and extensive photographic recordation in accordance with the MOA's stipulations. The HAER documentation was submitted to and accepted by the U.S. Department of Interior National Park Service (NPS) in March 1998. As also required in the 1997 MOA, LBNL has consulted with the NPS regarding proper mitigation and documentation necessary to offset the demolition and removal of the Bevatron. The NPS determined that an addendum to the HAER report would meet the requirements of the Historic American Building Survey (HABS) for pre-demolition documentation of Building 51 and would serve as partial mitigation for the loss of the building.

The addendum was required by the NPS to provide further and more detailed documentation of the Building 51 complex. The addendum has been completed and is currently under review by the NPS. Demolition cannot commence until the NPS accepts the document. In addition, as part of the EIR for the demolition of Building 51, LBNL indicated that it plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or a display listing the historic discoveries that occurred there. Along with the previously completed HAER documentation, which included a written historical and architectural description of the building and accelerator, and extensive photographic recordation, and the HABS addendum to the HAER, the Lab's proposed monument and/or display will reduce the effects of demolition of Building 51, but not to a less-than-significant level. Accordingly, the *Demolition of Building 51 and the Bevatron EIR* found that demolition will result in a significant, unavoidable impact on cultural resources that cannot be fully mitigated (LBNL, 2006). This EIR is currently anticipated to be considered for certification in early 2007.

Current Studies of Archaeological Resources

Field surveys and archival research at the California Historical Resources Information System's Northwest Information Center have been undertaken to determine whether any archaeological resources have been discovered at LBNL. (For details about the Northwest Information Center, see discussion of the State Office of Historic Preservation under "Federal and State Regulatory Environment" below.) The Northwest Information Center has indicated there is a "low potential

4 Building 51A is an integral addition to Building 51. Hereafter, unless otherwise required, the two structures are referred to as Building 51.

for Native American sites in the project area" and thus "a low possibility of identifying Native American or historic-period archaeological deposits in the project area" (Northwest Information Center, 2003). Additionally, field studies conducted at various times at LBNL have not encountered any archaeological resources. Native American archaeological sites in this portion of Alameda County tend to be situated on terraces along ridgetops, midslope terraces, alluvial flats, near ecotones, and near sources of water, including springs. LBNL is situated on a steep slope adjacent to Strawberry Creek. Therefore, there is a low-to-moderate potential for Native American sites on the project site.

IV.D.2.3 Federal and State Regulatory Environment

National Register of Historic Places

The National Register of Historic Places is the nation's master inventory of known historic resources. The National Register is administered by the National Park Service and includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. Properties are nominated to the National Register of Historic Places by the State Historic Preservation Officer of the state in which the property is located, by the Federal Preservation Officer for federally owned or controlled property, or by the Tribal Preservation Officer for tribally owned property. Generally, structures, sites, buildings, districts, or objects must be at least 50 years old or "exceptionally important" to be considered eligible for listing in the National Register as significant historic resources.

State Office of Historic Preservation

The State Office of Historic Preservation maintains the California Register of Historical Resources, an authoritative listing of the state's significant historic resources as well as architectural, archaeological, and cultural resources. The California Register includes properties listed in or formally determined eligible for the National Register, pursuant to Section 4851(a) of the Public Resources Code, and lists selected California Registered Historical Landmarks. The State Office of Historic Preservation also maintains the *Directory of Properties in the Historic Property Data File*. Properties on the Property Data File are not protected or regulated.

The State Office of Historic Preservation sponsors the California Historical Resources Information System (CHRIS), a statewide system for managing information on the full range of historical resources identified in California. CHRIS is a cooperative partnership among the citizens of California, historic preservation professionals, 11 information centers, and various agencies (Office of Historic Preservation, 2003). CHRIS provides an integrated database that furnishes site-specific archaeological and historical resources information on known resources and surveys to government, institutions, and individuals. CHRIS also supplies a list of qualified consultants. Information for the project area is available through CHRIS's Northwest Information Center.

IV.D.2.4 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies contained in the Berkeley and Oakland general plans, as well as other city provisions relevant to cultural resources at LBNL.

Berkeley General Plan

The Urban Design and Preservation Element of the City of Berkeley General Plan contains policies relating to the development and preservation of cultural resources in the city. None of the facilities at LBNL are listed by City of Berkeley as a historical resource (City of Berkeley, 2002). Urban Design and Preservation Element policies pertaining to the proposed LRDP are as follows:

> <u>Policy UD-5 Architectural Features</u>: Encourage, and where appropriate require, retention of ornaments and other architecturally interesting features in the course of seismic retrofit and other rehabilitation work.
>
> <u>Policy UD-6 Adaptive Reuse</u>: Encourage adaptive reuse of historically or architecturally interesting buildings in cases where the new use would be compatible with the structure itself and the surrounding area.
>
> <u>Policy UD-10 The University of California</u>: Strongly support actions by the University to maintain and retrofit its historic buildings, and strongly oppose any University projects that would diminish the historic character of the campus or off-campus historic buildings…
>
> <u>Policy UD-36 Information on Heritage</u>: Promote, and encourage others to promote, understanding of Berkeley's built and cultural heritage, the benefits of conserving it, and how to sensitively do that.

City of Berkeley Landmarks Preservation Ordinance

The City of Berkeley's Landmarks Preservation Ordinance, adopted in 1974, requires the City to establish a list of potential buildings that should be considered for landmark, historic district, or structure of merit status. The ordinance outlines procedures for designating properties as landmarks and for reviewing proposed physical changes to landmark buildings. A Landmarks Preservation Commission appointed by the City Council and City staff administers the ordinance. To be designated as landmarks or as structures of merit, buildings must meet criteria for consideration set forth in the ordinance. The criteria consist of three levels of designation for historic buildings: properties of exceptional significance (landmarks), structures of merit, and properties that do not meet landmark criteria but are worthy of preservation as part of a neighborhood, block, or street front. In late 2006, the Bevatron machine and site, but not its housing structure (Building 51), were designated as City of Berkeley landmarks. The landmark designation is currently pending appeal to the Berkeley City Council. No other structures at the LBNL main site are listed as City of Berkeley historical resources.

Oakland General Plan

The Oakland General Plan Historic Preservation Element, adopted in 1994 and revised in 1998, identifies several categories of historical resources. Designated Historic Properties include three classes of City Landmarks (1 through 3, in declining order of importance); two classes of Preservation Districts (Areas of Primary Importance and Areas of Secondary Importance); and Heritage Properties, which are historic resources (designated by the Landmarks Preservation Advisory Board or Planning Commission) that are not Landmarks or Preservation Districts.[5] The Element also defines a category of Potential Designated Historic Properties (PDHPs), which are those properties that have an existing or contingency rating of "A" (highest importance), "B" (major importance), or "C" (secondary importance) in either the Oakland Cultural Heritage Survey (OCHS), a project of the City's Planning Department, or the Reconnaissance Survey, or have been determined by the surveys to contribute (or potentially contribute, based on contingency rating) to an Area of Primary Importance or Area of Secondary Importance. PDHPs are so identified by their survey rating; unlike Designated Historic Properties, PDHPs are not formally designated by any City body. None of the facilities at LBNL or in the nearby vicinity are listed as a City of Oakland historical resource.

Historic Preservation Element goals and policies applicable to the 2006 LRDP include the following:

> Historic Preservation Goal 2: To preserve, protect, enhance, perpetuate, use, and prevent the unnecessary destruction or impairment of properties or physical features of special character or special historic, cultural, educational, architectural or aesthetic interest or value. Such properties or physical features include buildings, building components, structures, objects, districts, sites, natural features related to human presence, and activities taking place on or within such properties or physical features.
>
> Policy 3.1 Avoid or Minimize Adverse Historic Preservation Impacts Related to Discretionary City Actions: The City will make all reasonable efforts to avoid or minimize adverse effects on the Character-Defining Elements of existing or Potential Designated Historic Properties which could result from private or public projects requiring discretionary City actions.
>
> Policy 3.5 Historic Preservation and Discretionary Permit Approvals: For additions or alterations to Heritage Properties or Potential Designated Historic Properties requiring discretionary City permits, the City will make a finding that: (1) the design matches or is compatible with, but not necessarily identical, to the property's existing or historical design; or (2) the proposed design comprehensively modifies and is at least equal in quality to the existing design and is compatible with the character of the neighborhood; or (3) the

[5] Eligibility requirements for designation as a Heritage Property include an existing or contingency Oakland Cultural Heritage Survey (OCHS) rating of A, B, or C; an existing or contingency Reconnaissance Survey rating of A or B; or is a contributor (or potential contributor based on contingency rating) to a potentially eligible Preservation District. The Heritage Property category was developed in the Historic Preservation Element to replace the City's Preservation Study List. However, as of 2006, the City has not initiated designation of a list of Heritage Properties.

existing design is undistinguished and does not warrant retention and the proposed design is compatible with the character of the neighborhood.

For any project involving complete demolition of Heritage Properties or Potential Designated Historic Properties requiring discretionary City permits, the City will make a finding that: (1) the design quality of the proposed project is at least equal to that of the original structure and is compatible with the character of the neighborhood; or (2) the public benefits of the proposed project outweigh the benefit of retaining the original structure; or (3) the existing design is undistinguished and does not warrant retention and the proposed design is compatible with the character of the neighborhood.

Policy 3.8 Definition of "Local Register of Historical Resources" and Historic Preservation "Significant Effects" for Environmental Review Purposes: For purposes of environmental review under the California Environmental Quality Act, the following properties will constitute the City of Oakland's Local Register of Historic Resources:

1) All Designated Historic Properties, and

2) Those Potential Designated Historic Properties that have an existing rating of "A" or "B" or are located within an Area of Primary Importance.

3) Until complete implementation of Action 2.1.2 (Redesignation), the "Local Register" will also include the following designated properties: Oakland Landmarks, S-7 Preservation Combining Zone properties, and Preservation Study List properties.

IV.D.3 Impacts and Mitigation Measures

IV.D.3.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines and the UC CEQA Handbook, the impacts of the proposed 2006 LRDP and its resulting projects on cultural resources would be considered significant if they would exceed the following Standards of Significance:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

These impact criteria constitute the significance standards for this environmental topic. The significance standards for the first and second bulleted impact criteria are further explained and defined below. In considering the third bulleted criterion, the Initial Study (see Appendix A) found that the 2006 LRDP would have no significant impact on a unique paleontological resource or site or a unique geologic feature at LBNL. During the course of development at LBNL, extensive excavation for buildings and infrastructure has not revealed the presence of unique paleontological or geologic resources, and thus implementation of the 2006 LRDP would not affect such resources. Therefore, no additional analysis of this criterion is required.

Section 15064.5 of the CEQA Guidelines defines a historical resource as including the following:

(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission for listing in, the California Register of Historical Resources.

(2) A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Public Resources Code Section 5024.1, Title 14 CCR, Section 4852).

Public Resources Code (PRC) Section 5020.1 and CEQA Guidelines Section 15064.5(b)(1) define a significant effect as one that would materially impair the significance of a historical resource. According to CEQA Guidelines Section 15064.5(b)(2), material impairment of a resource's historic significance could result if the project would:

- Demolish or materially alter in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register of Historic Resources;

- Demolish or materially alter in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to local ordinance or resolution (PRC Section 5020.1[k]), or its identification in a historical resources survey meeting the requirements of PRC Section 5024.1(g), unless a preponderance of evidence establishes that the resource is not historically or culturally significant; or

- Demolish or materially alter in an adverse manner those physical characteristics of a resource that convey its historical significance and that justify its eligibility for its inclusion in the California Register, as determined by the lead agency.

Generally, if a project follows the Secretary of the Interior's guidelines, its impact on a historical resource will be considered mitigated to a less-than-significant level (CEQA Guidelines Section 15064.5(b)(3)).

CEQA Guidelines Section 15064.5(c) applies to effects on archaeological sites. Effects on non-unique archaeological resources are not considered significant. Regarding unique archaeological resources, lead agencies may require that reasonable efforts be made to permit such resources to be preserved in place or left in an undisturbed state. To the extent that unique archaeological resources are not preserved in place or disturbed, mitigation measures to protect such resources are required (PRC Section 21083.2(c)). Additionally, mitigation measures may be imposed to make provisions for archaeological sites accidentally discovered during construction.[6]

IV.D.3.2 Impact Assessment Methodology

The project site has undergone cultural resources analyses in the form of archival research and field reconnaissance, which have been conducted by qualified archaeologists. The historic architectural resource analysis was completed by qualified architectural historians who visited LBNL to inspect the property, take photographs, review historical documentation on the buildings and structures (including previous environmental review projects), and complete archival research. Information gathered was used to evaluate whether the proposed LRDP activities would cause impacts on historic or cultural resources. The Lab will evaluate whether the cultural resources impacts of any later activity implemented pursuant to the LRDP were examined in this program EIR before finding the activity to be within the scope of the project covered by the program EIR. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3).

IV.D.3.3 2006 LRDP Principles, Strategies, and LBNL Design Guidelines

2006 LRDP Principles and Strategies

The 2006 LRDP proposes four fundamental principles that form the basis for the development strategies provided for each element of the LRDP. The one principle most applicable to the cultural resources aspect of new development is to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts on valued cultural resources that could result from implementation of the 2006 LRDP. (See Chapter III, Project Description for further discussion, and see Appendix B for a full listing of principles, strategies, and design guidelines.)

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[6] For the purposes of this EIR, the term "construction," unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LRDP Design Guidelines provide the following specific planning and design guidance relevant to cultural resources to achieve these design objectives (including by encouraging pedestrian travel on the main hill site, with the potential for commensurate reduction in vehicle travel):

- Complement building aesthetics and enhance visual value through creation of land form elements that are consistent with design on the Hill. Mass and site buildings to minimize their visibility and to "ensure each building contributes to a cohesive and coherent architectural expression through the Laboratory site."
- Each Research Cluster, because of topography, historic buildings, plant palette, and so on will develop a unique identity.
- Preserve the Hill's rustic landscape through provision of screening landscape elements for large buildings and the integration of buildings into the overall landscape using appropriate materials.
- There are many interesting historic objects scattered around the Lab. These artifacts are important reminders of the Lab's legacy as well as items of interest which stimulate interaction. Placement of these artifacts at major pedestrian nodes and at prominent locations in each commons is encouraged.
- Designers shall examine the architectural precedents, especially of historic buildings, present in the Research Cluster where their project is to be located. A clear rationale based on precedent for the architectural expression of each project will be developed.

IV.D.3.4 Impacts and Mitigation Measures – 2006 LRDP

Impact CUL-1: Implementation of the 2006 LRDP could cause a substantial adverse change in the significance of historical resources, as defined in CEQA Guidelines Section 15064.5, including historical resources that have not yet been identified. (Significant and Unavoidable)

As described under "Setting" above, demolition of Building 51 has been analyzed in a separate EIR. That EIR is currently anticipated to be considered for certification in early 2007. That EIR concluded that there would be a significant unavoidable impact to historic resources from the demolition of the Building 51, including the Bevatron equipment within that building, that would cause a substantial adverse change in the significance of a historic resource as defined in CEQA, and that this impact is unavoidable. That EIR also concluded that all other impacts would either be less then significant or mitigated to a less-than-significant level. In accordance with the National Historic Preservation Act and a Memorandum of Agreement among DOE, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation, LBNL has consulted with the NPS, which determined that an addendum to a previously prepared Historic American Engineering Record (HAER) report would meet the requirements of the Historic American Building Survey (HABS) for pre-demolition documentation of Building 51; this pre-demolition documentation would serve as partial mitigation for the loss of the building. In addition, as part of the EIR for the demolition of Building 51, LBNL indicated that it plans to commemorate the scientific achievements attributed to the Bevatron with a monument and/or a display listing the historic discoveries that occurred there. Along with the previously completed HAER documentation, which included a written historical and architectural description of the building and accelerator, and extensive photographic recordation, and the HABS addendum to the HAER, the Lab's proposed monument and/or display would reduce the effects of demolition of Building 51, but not to a less-than-significant level. Accordingly, the *Demolition of Building 51 and the Bevatron EIR* found that demolition will result in a significant, unavoidable impact on cultural resources that cannot be fully mitigated (LBNL, 2006). Demolition of Building 51 would represent a significant and unavoidable impact of the 2006 LRDP, as well. (See discussion of the Bevatron and the Building 51 complex in Chapter III, Project Description.)

Concerning other potential historical resources, as discussed under "Setting" above, LBNL has retained the Pacific Northwest National Laboratory to complete a series of reports to identify, survey, and evaluate approximately 245 buildings and structures at the LBNL site for potential eligibility for listing in the National Register. The Pacific Northwest National Laboratory's series of reports is not yet complete, nor have the reports been submitted to the State Historic Preservation Officer for concurrence. Preliminary findings of the surveys and research conducted by the Pacific Northwest National Laboratory suggest that Building 71 and Building 88 may be eligible for listing in the National Register. There are no current plans to demolish Buildings 71 and 88. However, should the buildings prove to be eligible for National Register listing, their demolition under the 2006 LRDP would result in a significant and unavoidable impact and implementation of Mitigation Measure D.2 would be required. (See Appendix E for additional discussion of Buildings 71 and 88.)

The 2006 LRDP proposes building demolition and replacement at various locations on the site. Thus, there is potential for activity under the LRDP to affect historically significant resources that have not yet been identified by the State Office of Historic Preservation as eligible for listing in the National Register. Should SHPO identify other buildings at LBNL as eligible for listing on the National Register, their demolition under the 2006 LRDP would also result in a significant and unavoidable impact and implementation of Mitigation Measure CUL-1 would be required. It is not currently anticipated that additional buildings will be identified for listing on the National Register beyond those discussed above.

> **Mitigation Measure CUL-1:** Mitigation for the demolition or substantial physical alteration of Buildings 71 and 88, and other historical buildings and structures at LBNL found to be significant historical resources at the completion of the ongoing surveys and research, shall include the development of a Memorandum of Agreement (MOA) among the Department of Energy, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation. Full implementation of the MOA's stipulations shall also be required as part of this mitigation measure.

The above mitigation measure is included, with regard to Building 51, in the EIR for the proposed demolition of that structure, including the Bevatron, and that mitigation is applicable to the LRDP, as well.

Based on the CEQA Guidelines, removal of buildings determined eligible for listing on the National Register would result in a substantial adverse change that cannot be fully mitigated; thus**,** the impact after mitigation would remain significant and unavoidable.

Significance after Mitigation: Significant and unavoidable.

Project Variant. The project variant proposes structural modifications that would be identical to those proposed under the 2006 LRDP. Therefore, the impact discussion and mitigation measure listed above would also apply to the project variant, and the project variant would result in a significant and unavoidable impact by causing a substantial adverse change in the significance of historical resource(s) as defined in CEQA Guidelines Section 15064.5.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. The locations of buildings, configurations, uses and other features of actual development may vary from the scenario. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of cultural resource impacts. The Illustrative Development Scenario includes several projects, such as the demolition of Building 51and construction of new buildings at the site of the Building 51 complex and the Old Town area, that would affect identified historical resources and potential historic resources. For the reasons stated above, potential projects under the 2006 LRDP such as those included in the Illustrative Development Scenario could affect other Lab buildings that might be deemed eligible for listing on the National Register in the future. The demolition of Building 51, or the demolition of any other buildings deemed eligible for listing on the National Register, would result in a significant and unavoidable impact, as would the LRDP, as described above.

Impact CUL-2: The proposed 2006 LRDP would allow demolition of buildings and structures at LBNL that have been found to be ineligible for listing in the National Register individually or as a district. (Less than Significant)

Implementation of the 2006 LRDP would result in a series of development and redevelopment projects at LBNL over the course of the next 20 years, including demolition and redevelopment of a substantial portion of the Lab's "Old Town" area. The Old Town area is approximately 15 acres in size and is the oldest section at LBNL. Many of the 30 buildings and structures in the

Old Town area would be demolished and replaced with development clusters according to the LBNL Design Guidelines developed pursuant to the proposed LRDP. The buildings and structures within these areas have been evaluated for historical significance by a qualified cultural resources team. Despite the fact that most Old Town buildings are over 50 years old, the findings are that none of the buildings or structures evaluated are individually, or as a district, determined to be eligible for listing in the National Register (Harvey, 2003). Their demolition and the subsequent redevelopment of this area would result in a less-than-significant impact.

Building 6, which houses the Advanced Light Source, is considered to be an important visual landmark at LBNL, and it is associated with the former 184-inch cyclotron at LBNL. While it is part of the Old Town area, it is not considered for demolition or replacement under the proposed 2006 LRDP.

Mitigation: None required.

Project Variant. Similar to the 2006 LRDP, the project variant proposes the demolition of buildings and structures within the Old Town area at LBNL that have been found to be ineligible for listing in the National Register individually or as a district. Therefore, their demolition and the subsequent redevelopment of this area would result in a less-than-significant impact on a historical resource defined under CEQA.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a reasonably foreseeable conceptual portrayal of potential development under the 2006 LRDP. The locations of buildings, configurations, uses and other features of actual development may vary from the scenario. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on archeological resources. Potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario, such as the demolition of buildings within the Old Town area, would affect buildings determined ineligible for listing in the National Register in the same manner as would the LRDP, as discussed above. This would result in a less-than-significant impact.

Impact CUL-3: Implementation of the proposed 2006 LRDP could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. (Significant; Less than Significant with Mitigation)

As already noted, the potential for Native American sites to exist on the project site is considered low to moderate, based on field surveys and archival research at the Northwest Information

Center. In the unlikely event that archaeological artifacts are discovered during construction (including grading, excavation, and other earthmoving activities), the following project-specific mitigation measure, which is included as part of the LBNL facilities construction specifications, would be implemented.

> **Mitigation Measure CUL-3:** If an archaeological artifact is discovered on-site during construction under the proposed LRDP, all activities within a 50-foot radius shall be halted and a qualified archaeologist shall be summoned within 24 hours to inspect the site. If the find is determined to be significant and to merit formal recording or data collection, adequate time and funding shall be devoted to salvage the material. Any archaeologically important data recovered during monitoring shall be cleaned, catalogued, and analyzed, with the results presented in a report of finding that meets professional standards.
>
> **Significance after Mitigation:** Less than significant.

Project Variant. The project variant proposes structural modifications that would be identical to those proposed under the 2006 LRDP. Therefore, the impact discussion and mitigation measure listed above would also apply to the project variant. Implementation of Mitigation Measure CUL-3 would reduce potential impacts on archeological resources associated with the project variant to a less-than-significant level.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on archeological resources. The locations of buildings, configurations, uses and other features of actual development may vary from the scenario. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario, including construction of new buildings at the site of the Building 51 complex and Old Town area, could affect subsurface archeological resources in the same manner as would the LRDP. Although the likelihood of discovering subsurface archeological resources is relatively low due to prior development, such resources could be uncovered. To ensure that potential impacts on archeological resources would be less than significant, Mitigation Measure CUL-3 would apply to projects under the LRDP such as those identified in the Illustrative Development Scenario.

Impact CUL-4: Implementation of the proposed 2006 LRDP could disturb human remains, including those interred outside of formal cemeteries. (Significant; Less than Significant with Mitigation)

As discussed under the previous impact, there is no known evidence of prehistoric habitation at LBNL, nor any indication that the site has been used for burial purposes in the recent or distant past. Thus, encountering human remains at the LBNL site would be unlikely. However, if human remains should be encountered during excavation and construction, work would be halted and the following project-specific Mitigation Measure CUL-4 would be implemented.

> **Mitigation Measure CUL-4:** In the event that human skeletal remains are uncovered during construction or ground-breaking activities resulting from implementation of the 2006 LRDP at the LBNL site, CEQA Guidelines Section 15064.5(e)(1) shall be followed:

- In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

  (1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

    (A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and

    (B) If the coroner determines the remains to be Native American: (1) The coroner shall contact the Native American Heritage Commission within 24 hours. (2) The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. (3) The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or

  (2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

    (A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission;

    (B) The descendant identified fails to make a recommendation; or

    (C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

Significance after Mitigation: Less than significant.

Project Variant. Demolition and new construction proposed under the project variant would be similar to that proposed by the 2006 LRDP. Therefore, Impact CUL-4 and Mitigation Measure CUL-4, listed above, would also apply to the project variant. Implementation of Mitigation Measure CUL-4 would reduce potential impacts on human remains attributed to the project variant to a less-than-significant level should human remains be encountered during excavation and construction.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a reasonably foreseeable conceptual portrayal of potential development under the 2006 LRDP. The locations of buildings, configurations, uses and other features of actual development may vary from the scenario. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of potential impacts on human remains. For the reasons stated above, potential individual projects identified in the Illustrative Development Scenario, including the construction of new buildings at the site of the Building 51 complex and the Old Town area, could affect human remains in the same manner as would the LRDP. The likelihood of encountering human remains at the Old Town area is low because of prior development and subsurface alterations associated with construction of the existing Old Town buildings. In the event that human remains should be encountered during excavation and construction, for a potential project under the LRDP such as those identified in the scenario, Mitigation Measure CUL-4 would apply and would reduce any potential impacts relating to the possible discovery of the human remains.

IV.D.3.6 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex – housing the Bevatron accelerator – although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Additional projects currently underway at UC Berkeley, described in Section VI.C, Cumulative Impacts, of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis includes the City of Berkeley, including the UC Berkeley campus, and the City of Oakland, and the analysis considers development in those areas and not exclusively at LBNL. This analysis evaluates whether the impacts of the proposed

LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.D-10) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance. Specifically, with regard to cultural resources, the LRDP would contribute considerably to a significant cumulative impact only if the historical resources affected by the LRDP share historic significance with other resources that would be adversely affected by cumulative development.

Impact CUL-5: Implementation of the proposed 2006 LRDP would not combine with other cumulative projects to result in an adverse change to the significance of historical resources that share historic significance with resources that could be lost at Berkeley Lab. (Less than Significant)

The Southeast Campus Integrated Projects (SCIP) would result in significant and unavoidable impacts with regard to historical resources due to changes to Memorial Stadium, demolition of several structures, and alterations to buildings and landscape along Piedmont Avenue. For the most part, the buildings and facilities that would be adversely affected by the SCIP do not share historical associations with the Building 51 complex or with other facilities at LBNL. However, there is one potential exception: Calvin Laboratory, a UC Berkeley building occupied by LBNL staff and researchers that would be demolished under the SCIP. Although constructed in 1964 and therefore less than 50 years old—the normal minimum age for designation as a historical resource—Calvin Laboratory was identified in the SCIP Draft EIR as a historical resource because of its association with Melvin Calvin, a Nobel laureate who made significant contributions to science, especially in his research on photosynthesis. Calvin, a 1961 Nobel Laureate in chemistry, was a longtime UC Berkeley faculty member and was also one of the first chemists to join Ernest O. Lawrence's Radiation Laboratory, the predecessor to Berkeley Lab. Calvin and his research team mapped the route that carbon travels through a plant during photosynthesis and showed that sunlight acts on the chlorophyll in a plant to fuel the manufacturing of organic compounds, rather than on carbon dioxide as was previously believed. Calvin, like Lawrence, was a believer in interdisciplinary, collaborative science. In 1995, Berkeley Lab named one of the roads on the main hill site after Calvin (LBNL, 1997). Despite the connection between Calvin Laboratory and LBNL, the 2006 LRDP would not adversely affect buildings with particular historical association to Melvin Calvin, whose pioneering work was undertaken in facilities on the UC Berkeley campus. Moreover, it would be the UC Berkeley SCIP that would demolish Calvin Laboratory. Therefore, the LBNL 2006 LRDP would not result in a considerable contribution to any cumulative adverse impact on historical resources related to association with Melvin Calvin.

Concerning other potential cumulative impacts, the areas surrounding LBNL are either built out or would be retained as open space under the 2006 LRDP, thus limiting development opportunities in undisturbed areas. Therefore, the potential for the proposed LRDP to result in the discovery of historic architectural resources or other cultural resources is low. As there are no known or reasonably foreseeable projects in the immediate areas adjacent to LBNL that could combine with LRDP projects, cumulative impacts on cultural resources would not be considered cumulatively considerable.

Furthermore, as specific projects are proposed in the vicinity and LBNL and in the region, lead agencies would have to determine, on a case-by-case basis, whether the potential for historical or archaeological resources to be disturbed or adversely affected exists at a particular site. In the case of historical resources, it is frequently, but not always, known in advance of project consideration whether a building is so qualified. It is not uncommon, however, for additional research to be required in order to determine conclusively whether a building proposed for alteration or demolition is considered a historical resource for purposes of CEQA. In the case of subsurface (archaeological) resources, it is only seldom that it is possible to know of the existence of such resources ahead of project consideration. Therefore, site-specific research on the presence of historical and/or archaeological resources is frequently one of the first considerations in project planning and CEQA review. Accordingly, while it cannot be stated with certainty the nature of the cumulative impact, the fact that the LRDP's impacts would be relatively minimal, combined with the site- and project-specific considerations that must be given to subsequent projects elsewhere in the vicinity and the region, implementation of the LRDP is not expected to result in a considerable contribution to any potential cumulatively significant effects on historical and archaeological resources.

Mitigation: None required.

Project Variant. The analysis above would apply to the project variant. Because the impacts of the project variant on historical resources would be relatively minimal, combined with the site- and project-specific considerations that must be given to subsequent projects elsewhere in the vicinity and the region, implementation of the LRDP is not expected to result in a considerable contribution to any potential cumulatively significant effects on historical and archaeological resources.

Individual Future Project/Illustrative Development Scenario. A future project identified in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development as discussed above, would also, for the reasons stated above, result in a cumulative impact on historical and archeological resources that would be less than significant.

IV.D.4 References – Cultural Resources

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IV.E. Geology and Soils

IV.E.1 Introduction

This section discusses the potential project effects related to geology and soils that could result from continued University operation of LBNL, including continued facility development and operation under the 2006 LRDP.

The following discussion describes LBNL's regional geologic and seismic setting and analyzes potential geologic and seismic hazards that may affect the proposed project based upon the site conditions and location. The analysis focuses on increased exposure of people and structures to hazards such as surface fault rupture, groundshaking, landsliding, and erosion.

IV.E.2 Setting

IV.E.2.1 Geologic Setting

LBNL lies within the geologic region of California referred to as the Coast Ranges geomorphic province.[1] Discontinuous northwest-trending mountain ranges, ridges, and intervening valleys composed of ancient seafloor rocks characterize this province. The Coast Ranges are composed primarily of sedimentary rocks from the Jurassic Age to Miocene Epoch (approximately 206 to 5 million years ago).

LBNL is located on the western slopes of the Oakland-Berkeley hills within the central region of the Coast Ranges geomorphic province. The Miocene Orinda Formation, deposited between 13 and 10.5 million years ago and composed of poorly indurated (relatively soft), non-marine mudstone and sandstone, underlies the majority of LBNL. The western and southern portions of the site are underlain by marine mudstone and sandstones deposited in the late Cretaceous (99 to 65 million years ago) as part of the Great Valley Group. Some of the higher elevation portions of LBNL, as well as a portion of the eastern part of the site, are underlain by paleolandslide deposits comprised of Moraga Formation rocks. These deposits are composed of andesitic breccia with a small proportion of interbedded volcaniclastic sandstone and conglomerate. A small portion of the very eastern extent of LBNL is underlain by the middle to late Miocene (16 to 5 million years ago) San Pablo Group, consisting of shallow marine sandstones, and the early to middle Miocene (24 to 12 million years ago) Claremont Formation, consisting of well-consolidated, interbedded chert and shale with minor amounts of sandstone (LBNL, 2000).

1 A geomorphic province is an area that possesses similar bedrock, structure, history, and age. California has 11 geomorphic provinces.

IV.E.2.2 Mineral Resources

The California Department of Conservation, Geological Survey (CGS, formerly Division of Mines and Geology) has classified lands within the San Francisco–Monterey Bay Region into Aggregate and Mineral Resource Zones (MRZs) based on guidelines adopted by the California State Mining and Geology Board, as mandated by the Surface Mining and Reclamation Act of 1974 (Stinson et al., 1983). LBNL is mapped by the CGS as MRZ-1, an area where no significant mineral or aggregate deposits are present (Stinson et al., 1983).

IV.E.2.3 Soils

The U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) (formerly known as the Soil Conservation Service) has characterized the majority of on-site soils as Xerorthens-Millsholm complex, 30 to 50 percent slope. These are well-drained soils that generally allow for rapid runoff of precipitation and are highly susceptible to erosion, although rainwater runoff is known to be minimal in vegetated areas of the Lab. The southern portion of LBNL is underlain by Altamont Clay, 30 to 50 percent slope. This is a deep, well-drained soil that has a high shrink-swell and erosion potential. The southwest corner of LBNL is underlain by Maymen loam, 30 to 75 percent slope. Maymen loam is a shallow, fine-grained soil that exhibits rapid runoff and is highly susceptible to erosion. The eastern portion of the site is partially underlain by Maymen-Los Gatos complex, 30 to 75 percent slope. These are shallow to moderately deep soils that are highly susceptible to erosion (USDA NRCS, 1981). Soil characteristics at LBNL vary somewhat from the above, however, due to historic grading activities that have altered native soil profiles.

IV.E.2.4 Topographic Setting

Topographic elevations at LBNL range from approximately 450 to 1,100 feet above mean sea level (amsl). Although elevations generally decrease towards the west and south, a series of small canyons and ridgelines associated with surface water drainages results in a complex, varied topographic profile across the site. As noted on Figure IV.G-1 in Section IV.G, Hydrology and Water Quality, the site is in the Strawberry Creek Watershed.

IV.E.2.5 Groundwater

Depth to groundwater throughout the site varies significantly and seasonally from zero to approximately 100 feet below ground surface, due to the steep slopes and varying rock types at LBNL (LBNL, 2004). Historic development at LBNL has included the installation of hydraugers[2] to facilitate hillside drainage and minimize saturation of steep slopes; groundwater collected in hydraugers is subsequently directed both back out onto stable slopes at lower elevations, and into LBNL’s storm drain system, as further explained in Section IV.G, Hydrology and Water Quality.

[2] Hydraugers are horizontal drain pipes inserted into the hillside to draw off groundwater, some of which otherwise would eventually reach the natural drainage channels and which could, if not drained by means of the hydraugers, result in slope instability when excessive moisture builds up in the soil.

IV.E.2.6 Seismicity

The San Francisco Bay Area contains both active and potentially active faults and is considered a region of high seismic activity (see Figure IV.E-1).[3] The 2001 California Building Code locates the entire Bay Area within Seismic Risk Zone 4. Areas within Zone 4 are expected to experience maximum magnitudes and damage in the event of an earthquake (Lindeburg, 1998). On the basis of research conducted since the 1989 Loma Prieta earthquake, the U.S. Geological Survey (USGS) and other scientists, comprising the Working Group on California Earthquake Probabilities, have concluded that there is a 62-percent probability of at least one magnitude 6.7 or greater earthquake striking the San Francisco Bay Area before 2032 (USGS, 2003).

The estimated (moment) magnitudes shown in Table IV.E-1 represent characteristic earthquakes on particular faults in the San Francisco Bay Area.[4] While magnitude is a measure of the energy released in an earthquake, intensity is a measure of the groundshaking effects at a particular location. Ground movement during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material. The composition of underlying soils, even those relatively distant from faults, can intensify groundshaking. The Modified Mercalli (MM) intensity scale (see Table IV.E-2, p. IV.E-6) is commonly used to measure earthquake effects due to groundshaking. The MM values range from I (earthquake not felt) to XII (damage nearly total), and values ranging from IV to X could cause moderate to significant structural damage.[5] At LBNL, maximum groundshaking resulting from an earthquake generated on the Hayward fault, as discussed below, is anticipated to be violent to very violent (MM IX to MM X) (ABAG, 2003a).

IV.E.2.7 Regional Faults

The Hayward Fault Zone traverses the western edge of the LBNL site; the San Andreas Fault Zone is located approximately 19 miles southwest (see Figure IV.E-1). The San Andreas and Hayward faults exhibit strike-slip orientation and have experienced movement within the last 150 years.[6] Other principal faults in the vicinity of LBNL that are capable of producing significant groundshaking at the project site are listed on Table IV.E-1 and include the San Gregorio–Hosgri, Calaveras, Concord–Green Valley, Marsh Creek–Greenville, and Rodgers Creek faults.

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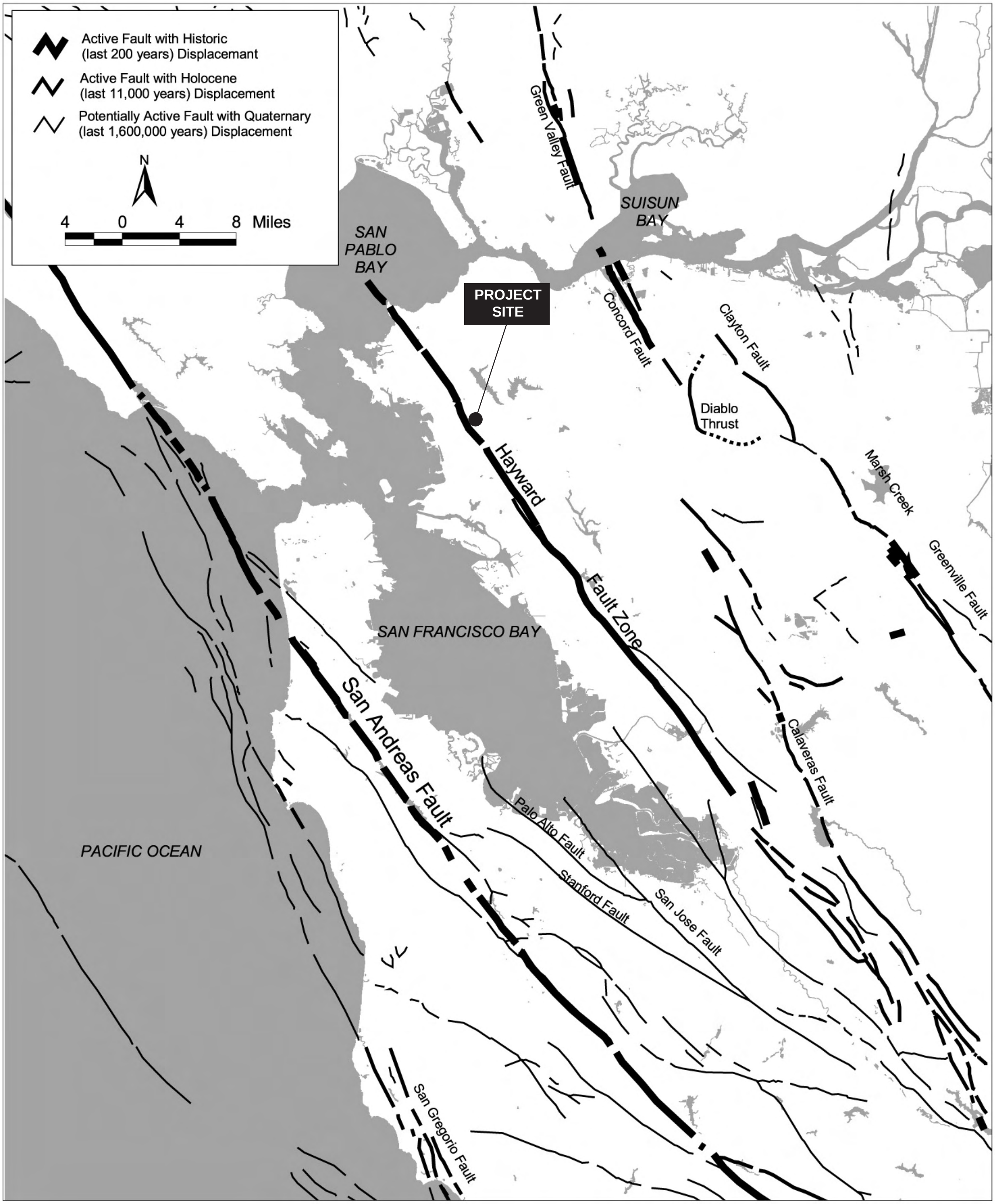
3 An “active” fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 11,000 years). A “potentially active” fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. “Sufficiently active” is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (Hart, 1997).

4 Moment magnitude is related to the physical size of a fault rupture and movement across a fault. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event (CGS, 1997b). The concept of “characteristic” earthquake means that we can anticipate, with reasonable certainty, the actual earthquake that can occur on a fault.

5 The damage level represents the estimated overall level of damage that will occur for various MM intensity levels. The damage, however, will not be uniform. Some buildings will experience substantially more damage than this overall level, and others will experience substantially less damage. Not all buildings perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a building all affect its performance (ABAG, 1998).

6 A strike-slip fault is a fault on which movement is parallel to the fault’s strike (Bates and Jackson, 1984).



SOURCE: California Department of Conservation,
California Geological Survey (After Jennings, 1994), 2003

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Figure IV.E-1
Fault Map

TABLE IV.E-1
ACTIVE FAULTS IN THE VICINITY OF LBNL

Fault	Distance and Direction from LBNL	Recency of Movement	Fault Classification[a]	Historical Seismicity[b]	Maximum Moment Magnitude Earthquake (MM)[c]
Hayward	Bisects western edge of site	Historic (1868, southern segment) Holocene	Active	M6.8, 1868 Many <M4.5	7.1
Concord–Green Valley	14 miles northeast	Historic (1955) Holocene	Active	Historic active creep	6.9
San Andreas	19 miles southwest	Historic (1906; 1989) Holocene	Active	M7.1, 1989 M8.25, 1906 M7.0, 1838 Many <M6	7.9
Calaveras	18 miles southeast	Historic (1861) Holocene	Active	M5.6–M6.4, 1861 M4–M4.5 swarms 1970, 1990	6.8
Rodgers Creek	23 miles north	Historic Holocene	Active	M6.7, 1898	7.0
				M5.6, 5.7, 1969	
Marsh Creek–Greenville	25 miles east	Historic (1980) Holocene	Active	M5.6 1980	6.9
San Gregorio–Hosgri	26 miles southwest	Holocene – Late Quaternary	Active	Many M3–6.4	7.3

[a] Refer to footnote 3.
[b] Richter magnitude (M) and year for recent and/or large events. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave.
[c] Moment magnitude is related to the physical size of a fault rupture and movement across a fault. Moment magnitude provides a physically meaningful measure of the size of a faulting event (CGS, 1997b). The Maximum Moment Magnitude Earthquake (MM) derived from the joint CGS/USGS Probabilistic Seismic Hazard Assessment for the State of California, 1996. (CGS OFR 96-08 and USGS OFR 96-706).

SOURCES: Hart, 1997; Jennings, 1994; Peterson, 1996.

Hayward Fault Zone

The Hayward Fault Zone is the southern extension of a fracture zone that includes the Rodgers Creek fault (north of San Pablo Bay), the Healdsburg fault (Sonoma County), and the Maacama fault (Mendocino County). The Hayward fault trends to the northwest within the East Bay, extending from San Pablo Bay in Richmond 60 miles south to San Jose, where it converges with the Calaveras fault, a similar type fault that extends north to Suisun Bay. Historically, the southern portion of the Hayward fault generated a large to major earthquake in 1868. The USGS Working Group on California Earthquake Probabilities estimates there is a 27-percent chance the Hayward–Rodgers Creek Fault System will experience an earthquake of M 6.7 or greater by 2032 (USGS, 2003).

TABLE IV.E-2
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description	Average Peak Acceleration
I	Not felt except by a very few persons under especially favorable circumstances.	< 0.0017 g[a]
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	< 0.014 g
III	Felt noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly, vibration similar to a passing truck. Duration estimated.	< 0.014 g
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	0.014–0.039 g
V	Felt by nearly everyone, many awakened. Some dishes and windows broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles may be noticed. Pendulum clocks may stop.	0.039–0.092 g
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; and fallen plaster or damaged chimneys. Damage slight.	0.092–0.18 g
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.18–0.34 g
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	0.34–0.65 g
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.65–1.24 g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 1.24 g
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 1.24 g
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 1.24 g

[a] g (gravity) = 980 centimeters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

SOURCES: Bolt, 1988; California Geological Survey, 2003a.

San Andreas Fault Zone

The San Andreas Fault Zone is the longest in the state, extending from the Salton Sea in Southern California near the border with Mexico to north of Point Arena, where the fault trace extends out into the Pacific Ocean. The main trace of the San Andreas fault through the Bay Area trends northwest through the Santa Cruz Mountains and the eastern side of the San Francisco Peninsula. As the principal strike-slip boundary between the Pacific plate to the west and the North American plate to the east, the San Andreas is often a highly visible topographic feature, such as between the city of Half Moon Bay and Interstate 280, where Crystal Springs Reservoir and San Andreas Lake clearly mark the rupture zone.

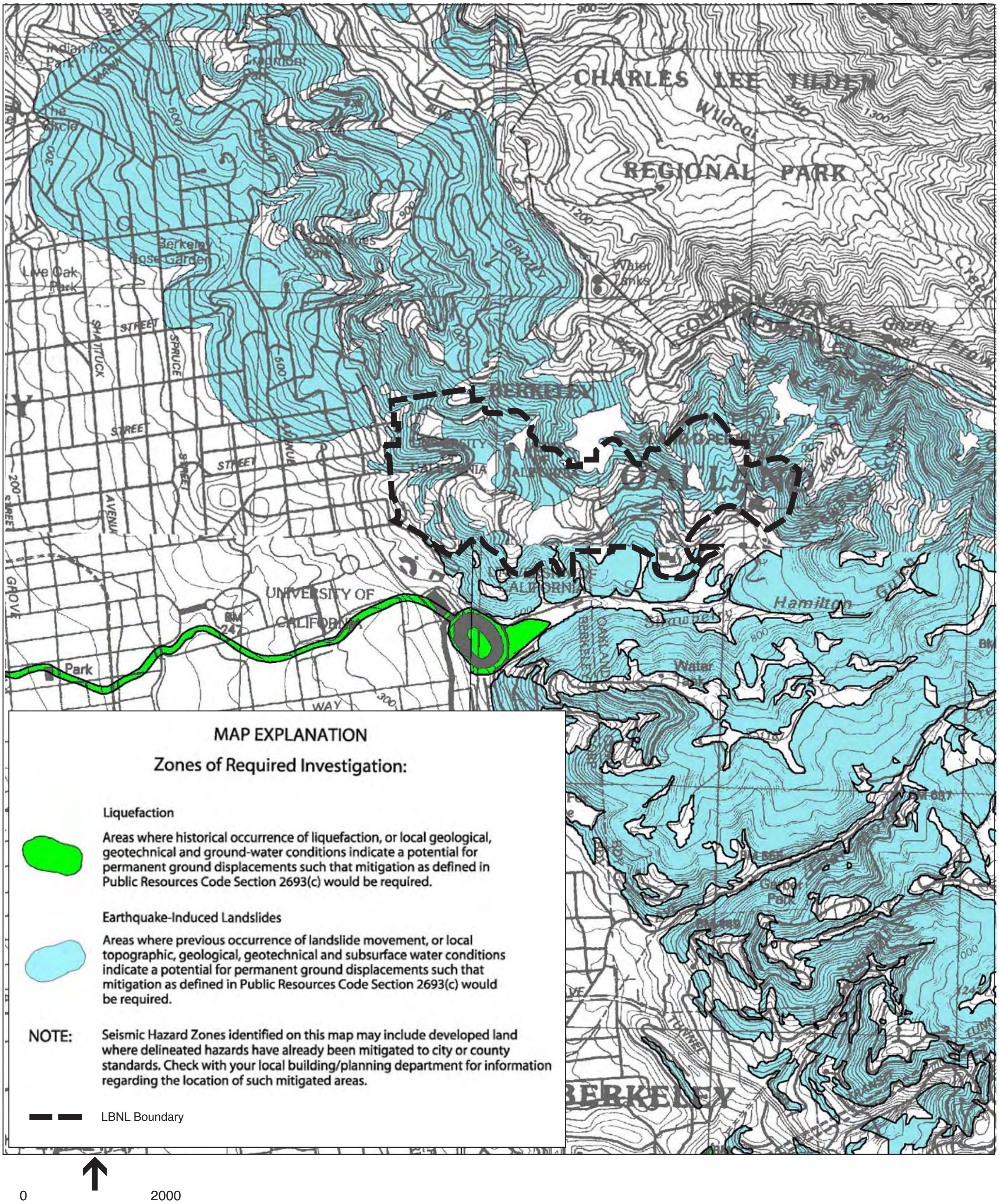
The San Andreas Fault Zone was the source of the two major seismic events in recent history that resulted in widespread damage throughout the San Francisco Bay region: the 1906 San Francisco earthquake (M 8.25), and the more recent 1989 Loma Prieta earthquake (M 7.1). The USGS Working Group on California Earthquake Probabilities estimates there is a 21-percent chance of the San Andreas fault experiencing an earthquake of M 6.7 or greater by 2032 (USGS, 2003).

IV.E.2.8 Geologic Hazards

Slope Failure

Slope failure can occur due any combination of the following factors: site slope, geology, precipitation amount and intensity, modifications due to grading, or seismic events. A slope failure is a mass of rock, soil, and/or debris displaced down a slope by sliding, flowing, or falling. Steep slopes and downslope creep of surface materials characterize landslide-susceptible areas. Approximately 60 percent of LBNL is located on slopes of greater than 25 percent and approximately 27 percent of the site is located on slopes greater than 45 percent. Due to steep topography, geology including landslide deposits, existing development of LBNL, the presence of shallow groundwater, and modification due to grading during development LBNL has numerous unstable slopes. Figure IV.E-2 illustrates the areas within LBNL identified by the CGS as Seismic Hazard Zones for earthquake-induced landslides (CGS, 1990 and 2003b). Although a majority of the Lab site is within these zones, most of the developed area is not.

Some of the unstable slopes have experienced ground failure during the history of LBNL. Due to these failures, LBNL has undertaken detailed study and mapping of unstable slopes within the site. Figure IV.E-3 depicts areas within LBNL prone to slope instability and classifies the risk potential of these areas to experience landslide activity (high, medium, and low risk). In addition, Figure IV.E-3 identifies areas where slope stabilization efforts have repaired the hillside and stabilized historic landslides (LBNL, 1999). Most of the mapped landslides or potential landslides at LBNL, as shown on Figure IV.E-3, are located within the earthquake-induced landslide hazard zones, as shown on Figure IV.E-2. As shown on Figure IV.E-3, Buildings 90, 46 and 46A are founded on landslides. The landslide beneath Buildings 46 and 46A and the portion of the landslides beneath Building 90 have been repaired and no longer represent a hazard to the buildings. In addition, a historic landslide was recently discovered under part of Building 85. LBNL is working with its geotechnical contractors to identify the steps necessary to repair this landslide, and will be promptly implementing those steps upon completion of the reports from the



SOURCE: California Department of Conservation, California Geologic Survey, 2003

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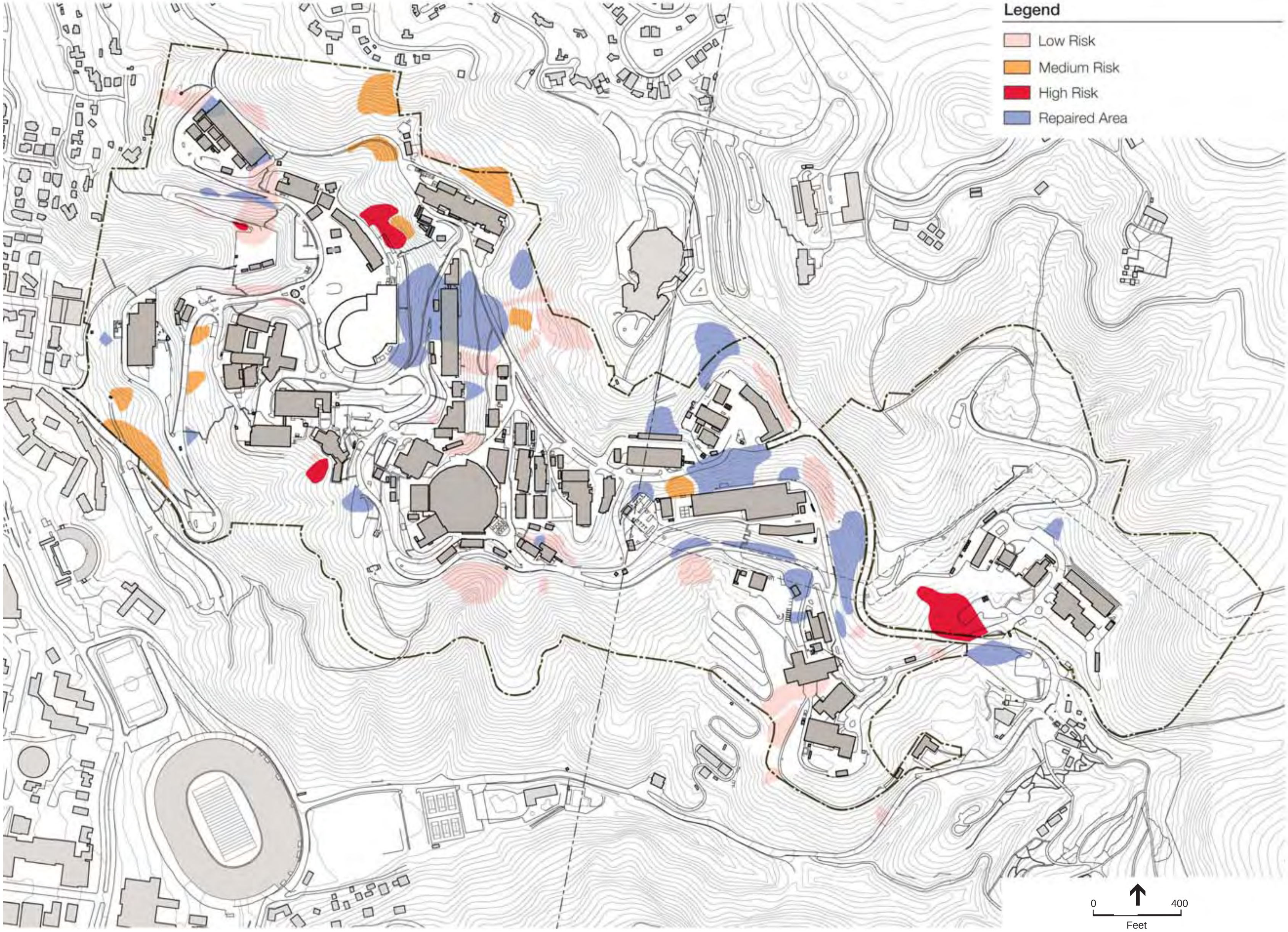
Figure IV.E-2
Seismic Hazard Zone Map



SOURCE: Lawrence Berkeley National Laboratory (2003)

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Figure IV.E-3
Slope Stability Map

geotechnical contractor. In addition, LBNL has implemented operational protections to avoid release of hazardous materials in the event of a slope failure. Note that earthquake-induced slope failure is addressed below under Seismic Hazards.

Expansive Soils

Expansive soils possess a “shrink-swell” characteristic. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in clay soils from the process of wetting and drying. While all clay soils exhibit this behavior, the volume change is of sufficient magnitude to require mitigation in only some clay soils. In these soils, structural damage may occur over a long period of time, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. The soil that underlies the majority of LBNL (Xerorthens-Millsholm complex, 30 to 50 percent slope) is not an expansive soil, due to its low percentage of fine-grained materials (clays). Similarly, the soils that underlie the eastern and southwest portions of the site possess a low to moderate shrink-swell potential. However, the Altamont Clay that underlies much of the southern portion of LBNL is a highly expansive soil, and shrink-swell hazards are present in this area of the site.

Soil Erosion

Soil erosion is a process whereby soil materials are worn away and transported to another area, either by wind or water. Rates of erosion can vary depending on the soil material and structure, placement, and human activity. Soil containing high amounts of silt can be easily eroded, while sandy soils are less susceptible. Excessive soil erosion can eventually damage building foundations and roadways. Erosion is most likely to occur on sloped areas with exposed soil, especially where unnatural slopes are created by cut-and-fill activities. Soil erosion rates can be higher during the construction phase. Typically, the soil erosion potential is reduced once the soil is graded and covered with concrete, structures, or asphalt. Soils throughout LBNL are highly susceptible to soil erosion due to LBNL’s steeply sloping topography, particularly when vegetation and surficial material is stripped for construction purposes.

IV.E.2.9 Seismic Hazards

The seismic hazards discussed below include those hazards that could reasonably be expected to occur within LBNL during a major earthquake on any of the Bay Area fault zones, especially the Hayward fault. Some hazards are more severe than others, depending on the location, underlying materials, and level of groundshaking. Certain of these hazards might not occur, or could occur with minor consequences.

Surface Fault Rupture

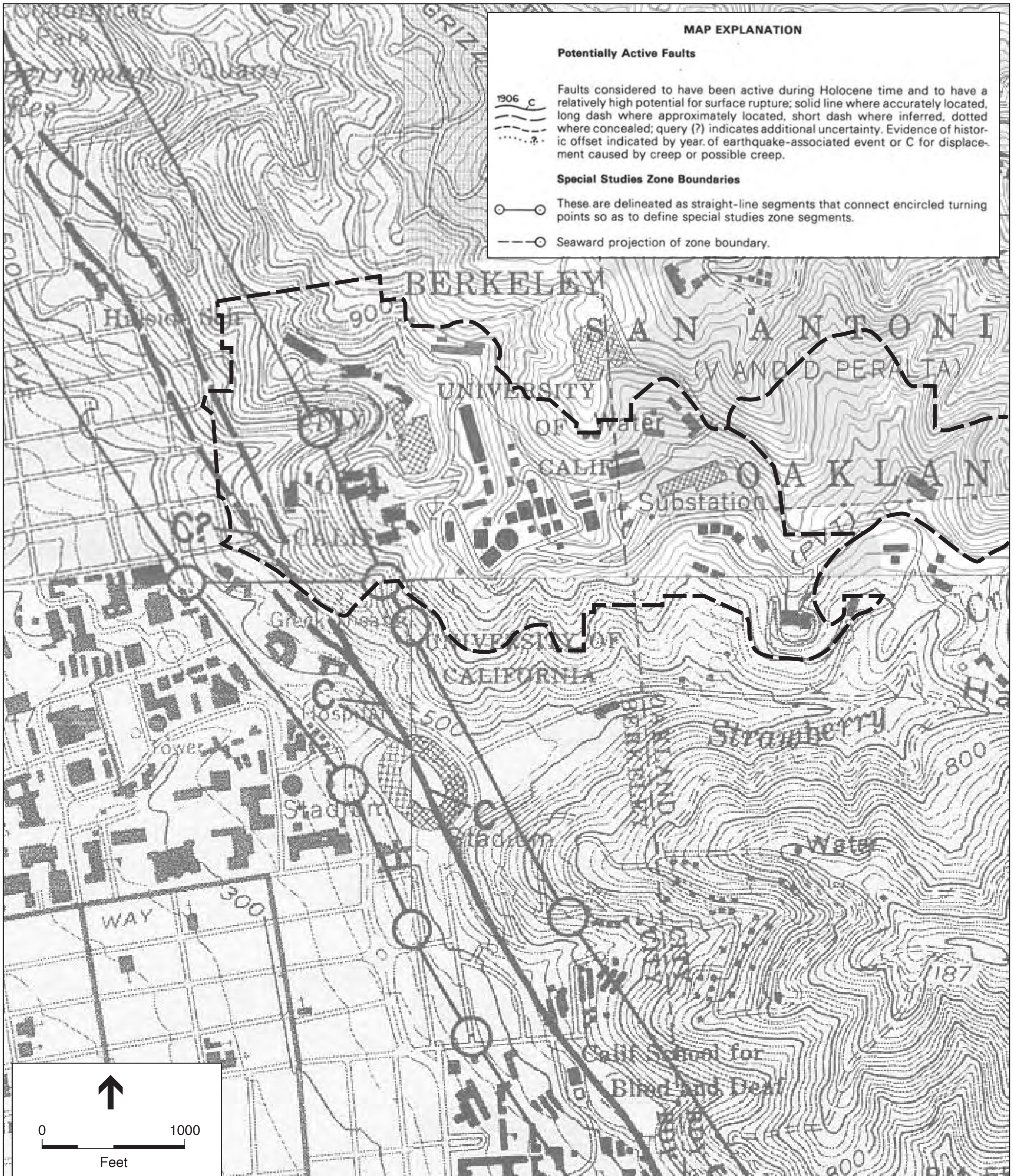
Fault rupture is defined as the differential displacement of the ground surface across a fault trace. Not all earthquakes result in fault rupture. For instance, the 1989 Loma Prieta and 1994 Northridge earthquakes did not result in fault rupture. Fault rupture generally occurs primarily on the trace of the fault which generated the earthquake. However, small ruptures have also been observed on fault traces other than that of the fault which generated the earthquake.

The magnitude and nature of fault ruptures can vary for different faults or even along different strands of the same fault. Surface ruptures can damage or collapse buildings, cause severe damage to roads and other paved areas, and cause failure of overhead as well as underground utilities. Fault rupture is considered more likely along active faults, which are referenced above. Future fault ruptures are generally expected along different strands of the same fault (CGS, 1997b).

The western edge of LBNL is located within an Alquist-Priolo Earthquake Fault Zone (Alquist-Priolo Zone) for the Hayward fault, as designated by the Alquist-Priolo Earthquake Fault Zoning Act (discussed below) and depicted on Figure IV.E-4, p. IV.E-12 (CGS, 1982a and 1982b). A fault rupture hazard study was conducted at LBNL during planning and design of what was then identified as Building 49, which is located within the Alquist-Priolo Zone (Fugro, 2002c). This study confirmed that active traces of the Hayward fault traverse LBNL; the Main Trace is approximately 350 feet downslope and west of the western edge of the then-proposed Building 49 footprint, and the West Trace is an additional 100 to 150 feet west.[7] The study confirmed that no active trace of the Hayward fault exists beneath this proposed building. (HLA, as cited in Fugro, 2002c). Construction or redevelopment within the Alquist-Priolo Zone under the LRDP could be subject to surface fault rupture hazards from the Hayward fault, particularly in areas nearest the Main or West Traces. The University Seismic Safety Policy precludes construction of new buildings over the trace of an active fault.

Historic development activities have also included study of fault rupture potential associated with the Wildcat fault during planning for the Biomedical Laboratory II project, adjacent to the Building 74 complex (Harding Lawson Associates, 1980), and the East Canyon fault during planning for Building 85 (Geo/Resource Consultants, 1994). These faults parallel the Hayward fault. The northern portion of the Wildcat fault near San Pablo was previously classified as an active fault under the Alquist-Priolo Act. However, following additional study, the northern portion of the Wildcat fault was reclassified as potentially active and therefore removed from regulation under the Alquist-Priolo Act. The portion of the Wildcat fault that traverses the LBNL site has never been classified as active. The above-mentioned studies confirmed the absence of evidence needed to classify either the Wildcat fault or the East Canyon fault as active, such as displacement of Quaternary deposits or fault-related topographic features; consequently, the studies concluded there was a low potential for fault rupture hazards at the proposed building locations. Additionally, the exposure of the Wildcat fault during grading for Building 84 revealed fault-crossing features which indicate surface rupture has not occurred during at least the last hundreds to thousands of years, confirming the results of the earlier study. Historic study of the Wildcat fault at LBNL has not revealed evidence that the fault should be considered active.

[7] Building 49 is no longer proposed; however, the LRDP Illustrative Development Scenario identifies a Building S-1 that is within the Alquist-Priolo Zone, just south of the former Building 49 site.



LBNL 2006 Long Range Development Plan . 201074

SOURCE: California Geological Survey

Figure IV.E-4
Alquist-Priolo Earthquake Fault Zone

Groundshaking

Strong ground movement from a major earthquake could affect LBNL. Earthquakes on the active faults (listed in Table IV.E-1, p. IV.E-5) are expected to produce a range of groundshaking intensities at the project site. Groundshaking may affect areas hundreds of miles distant from the earthquake's epicenter. A major seismic event on any of these active faults could cause significant groundshaking at the site, as experienced during earthquakes in recent history, namely the 1989 Loma Prieta earthquake (ABAG, 2003b).

According to CGS probabilistic seismic hazard maps, peak ground acceleration in the LBNL region could reach or exceed 0.7 g (Peterson et al., 2003).[8] A probabilistic seismic hazard map represents the severity of groundshaking from earthquakes that geologists and seismologists agree could occur, but which has a 90-percent chance of not being exceeded in 50 years (an annual probability of being exceeded of 1 in 475). It is "probabilistic" in the sense that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site, and expresses the probability of exceeding a certain ground motion.[9]

Historic geotechnical investigations have estimated peak bedrock accelerations of 0.7 g could occur within LBNL from an earthquake on the Hayward fault (Bolt, 1992). As a comparison, ground motion during the 1989 Loma Prieta earthquake at the Santa Cruz Mountains epicenter reached 0.64 g (CGS, 1990)

Slope Failure

Slope failures occur during earthquakes due to the effect of the dynamic forces on hillside soil and rock masses. As discussed above, the CGS has delineated earthquake-induced landslide hazard zones. Within these zones, the CGS has determined the potential for earthquake-induced landslides to occur is sufficiently high to require site-specific analysis of the hazard prior to development, as per the Seismic Hazards Mapping Act of 1990 (discussed below on p. IV.E-16). If such analysis determines that earthquake-induced slope failure is likely to occur, then appropriate design measures must be implemented as a condition of development.

Liquefaction

Liquefaction is a phenomenon whereby unconsolidated and/or near-saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground

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8 Peak ground acceleration is used as a measure of earthquake intensity because it can be related to the horizontal force exerted on a building, and therefore can be translated into building code standards. Peak ground acceleration is the greatest rate of increase in velocity of ground movement in an earthquake.

9 The CGS probabilistic seismic hazard map for 10-percent probability of exceedance in 50 years represents ground motions that geologists and seismologists do not think will be exceeded in the next 50 years. This probability level of groundshaking is used for formulating building codes and designing buildings in highly active seismic areas. Seismic maps are prepared using consensus information on historical earthquakes and faults (Peterson et al., 1999).

cables, and buildings with shallow foundations. Liquefaction can occur in areas characterized by shallow, water-saturated, cohesionless, granular materials, or in saturated unconsolidated or artificial fill sediments located in reclaimed areas along the margin of San Francisco Bay. Liquefaction potential is highest in areas underlain by Bay fills, Bay Mud, and unconsolidated alluvium. The CGS has not designated any portion of LBNL as a Seismic Hazard Zone for liquefaction, as shown on Figure IV.E-2 (CGS, 2000 and 2003b). Liquefaction hazards may be present at LBNL in areas underlain by shallow groundwater and poorly engineered fill or alluvial materials. However, the thin soil profile on hillside slopes and shallow bedrock serve to minimize potential liquefaction hazards at the site.

Earthquake-Induced Settlement

Settlement is the depression of the bearing soil when a load, such as that of a building or new fill material, is placed upon it. Soils tend to settle at different rates and by varying amounts depending on the load weight, and this tendency is referred to as differential settlement. Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill or the Bay Mud present in the marshland on the San Francisco Bay margin. Settlement can be accelerated and accentuated by earthquakes. Hazards associated with earthquake-induced settlement would be present for projects involving cut-and-fill activities. During an earthquake, settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials (particularly loose, noncompacted, and variable sandy sediments). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas susceptible to earthquake-induced settlement would include those underlain by thick layers of colluvial material or unengineered fill. The soil profile throughout LBNL is relatively shallow due to steep slopes, although natural drainages contain thicker deposits of colluvial and, to a lesser degree, alluvial materials. Construction or development that might alter LBNL's existing natural drainage channels is addressed under the 2006 LRDP Land Use Map and the LBNL Design Guidelines. Further, the Illustrative Development Scenario analyzed in this EIR calls for potential development at locations that would avoid major drainage channels and riparian areas.

Tsunami

Tsunamis are waves that are typically caused by underwater landslides, volcanic eruptions, or seismic events. These waves are longer in period and faster moving than typical, wind-generated ocean waves. Tsunami amplitudes range from inches to tens of feet. Due to their long wavelength and speed, larger tsunamis can run onto and inundate land a considerable distance with a considerable amount of energy. Areas that are highly susceptible to tsunami inundation tend to be located in low-lying coastal areas such as tidal flats, marshlands, and former bay margins that have been artificially filled but are still at or near sea level. The tsunami hazard at LBNL is extremely low to nonexistent, as the site is located a minimum of 450 feet above mean sea level.

Seiche

A seiche is a free or standing wave oscillation of the water surface in an enclosed or semi-enclosed basin, such as San Francisco Bay, that may be initiated by an earthquake.[10] Due to its location high in the Berkeley hills, LBNL is not subject to seiches in San Francisco Bay. There are no enclosed water bodies located upslope of LBNL. Potential seiche hazards are primarily associated with the detention pond located on Strawberry Creek near the southern site perimeter; however, there are no facilities located in close enough proximity to the pond to present seiche hazards, nor does the LRDP plan construction in this area.

IV.E.2.10 Regulatory Environment

University of California Seismic Safety Policy

On January 17, 1995, the University of California adopted and updated the Policy on Seismic Safety, which established University policy "to acquire, build, maintain, and rehabilitate buildings and other facilities which provide an acceptable level of earthquake safety." The policy applies to Berkeley Lab, which is operated by the University. The level of safety is also defined in the following University policy:

- *New Buildings and Other Facilities*. The design of new buildings shall, at a minimum, comply with the current provisions of the California Building Code, or local seismic requirements, whichever is more stringent. Provisions shall also be made for adequate anchoring of nonstructural building elements. No new University structures may be constructed on the trace of a known active fault. All plans shall be reviewed by a consultant structural engineer who must, prior to release of funds, certify that the structure complies with the University Policy on Seismic Safety.

Proposed projects under the 2006 LRDP that involve a facility lease between a third-party developer and the University would also be required to comply with the University's Seismic Safety Policy for Leased Buildings.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zones Act), signed into law in December 1972, requires the delineation of zones along active faults in California. The zones vary in width, but average about one-quarter-mile wide.[11] The purpose of the act is to regulate development on or near fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, which includes withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture is not necessarily restricted to areas within an Alquist-Priolo Zone, as designated under the Alquist-Priolo Act. The

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10 The "sloshing" produced by seiches within enclosed water bodies during earthquakes commonly occurs on a small scale in swimming pools.

11 California Geological Survey, Alquist-Priolo Fault Zones web page; available on the internet at: http://www.consrv.ca.gov/cgs/rghm/ap/index.htm. Viewed October 8, 2006.

western portion of LBNL near the Blackberry Canyon Gate (an area of approximately 17 acres) is located within an Alquist-Priolo Zone that is associated with the Hayward fault.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong groundshaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a Seismic Hazard Zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. Geotechnical investigations conducted within Seismic Hazard Zones must incorporate standards specified by CGS Special Publication 117, *Guidelines for Evaluating and Mitigating Seismic Hazards* (CGS, 1997c). The CGS has designated much of LBNL as a Seismic Hazard Zone for earthquake-induced landslides, as shown by Figure IV.E-2 (p. IV.E-8).

California Building Code

The California Building Code is another name for the body of regulations known as the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code (CBSC, 1995). Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable (Bolt, 1988).

The current (2001) California Building Code is based on the 1997 Uniform Building Code (UBC) and includes necessary California amendments that include criteria for seismic design. About one-third of the text within the California Building Code has been tailored for California earthquake conditions (ICBO, 1997). The California Building Code requires extensive geotechnical analysis and engineering for grading, foundations, retaining walls, and structures, with the nature and degree of analysis and engineering differentiated by zones. Berkeley, Oakland and the greater San Francisco Bay Area are located within Zone 4, which, of the four seismic zones designated in the United States, is expected to experience the greatest effects from earthquake groundshaking and therefore the California Building Code has the most stringent requirements for seismic design.

IV.E.2.11 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant local plans, policies, and ordinances promulgated by the cities of Berkeley and Oakland.

Berkeley General Plan

Berkeley General Plan policies pertaining to geology and seismicity relevant to implementation of the LBNL LRDP include the following:

> Policy S-14 Land Use Regulation. Require appropriate mitigation in new development, redevelopment/reuse, or other applications.
>
> *Actions:*
>
> A) When appropriate, utilize the environmental review process to ensure avoidance of hazards and/or mitigation of hazard-induced risk.
>
> B) Require soil investigation and/or geotechnical reports in conjunction with development/redevelopment on sites within designated hazard zones such as areas with high potential for soil erosion, landslide, fault rupture, liquefaction, and other soil-related constraints.
>
> C) Place structural design conditions on new development to ensure that recommendations of the geotechnical/soils investigation are implemented.
>
> D) Encourage owners to evaluate their buildings' vulnerability to earthquake hazards, fire, landslides, and floods, and to take appropriate action to minimize the risk.
>
> Policy S-15 Construction Standards. Maintain construction standards that minimize risks to human lives and property from environmental and human-caused hazards for both new and existing buildings.
>
> *Actions:*
>
> A) Periodically update and adopt the California Building Standards Code with local amendments to incorporate the latest knowledge and design standards to protect people and property against known fire, flood, landside, and seismic risks in both structural and non-structural building and site components.
>
> B) Ensure proper design and construction of hazard-resistant structures through careful plan review/approval and thorough and consistent construction inspection.
>
> Policy S-18 Public Information. Establish public information programs to inform the public about seismic hazards and the potential hazards from vulnerable buildings.

Oakland General Plan

The Open Space, Conservation and Recreation Element, adopted in 1996, addresses the management of open land, natural resources, and parks in Oakland.

Open Space Objective OS-1 is "To conserve and appropriately manage undeveloped areas in Oakland which have high natural resource value, scenic value, or natural hazards which preclude safe development." The following polices are relevant to the proposed project:

> Policy OS-1.3 Relate New Development to Slope. Limit intensive urban development to areas where the predominant slope is less than 15 percent. Design development on slopes

> between 15 and 30 percent to minimize alteration of natural landforms. Strongly discourage development on slopes greater than 30 percent. To the extent permitted by law, when land is subdivided into two or more lots, retain areas with slopes over 30 percent as private, public, or common open space.

Open Space Objective OS-3 is "To retain major institutional and functional open space areas and enhance their recreational and aesthetic benefits." The following polices are relevant to the proposed project:

> Policy OS-3.1 University, College, and Institutional Open Space. Retain open space at Oakland's universities, colleges, and other institutions where such open space provides recreational, aesthetic, conservation, or historic benefits. Where such open spaces are publicly owned, as at the community colleges, support the permanent retention of athletic fields and other recreational areas as open space. Such areas should not be converted to development unless they are replaced in kind with comparable areas or facilities in the immediate vicinity.

> Policy OS-3.1.1 Conservation of UC Hill Property. After creating the new Resource Conservation Zone,[12] work with the University of California to include in the zone portions of the campus designated for conservation in the campus Long Range Development Plan.

Open Space Objective OS-9 is "To retain Oakland's natural features and topography wherever possible and recognize their important role in defining the character and image of the city and its neighborhoods." The following polices are relevant to the proposed project:

> Policy OS-9.1 Protection of Natural Landforms. Design new development to preserve natural topography and terrain. Enhance prominent topographic features where appropriate by parks, plazas, or architectural expressions.

Conservation Objective CO-2 is "To minimize safety hazards, environmental impacts, and aesthetic impacts associated with development on hillsides and in seismic high-risk areas." The following polices are relevant to the proposed project:

> Policy CO-2.1 Slide Hazards. Encourage development practices which minimize the risk of landsliding.

> Policy CO-2.2 Unstable Geologic Features. Retain geologic features known to be unstable, including serpentine rock, areas of known landsliding, and fault lines, as open space. Where feasible, allow such lands to be used for low-intensity recreational uses.

> Policy CO-2.4 Hillside Cuts and Fills. Minimize hillside cuts and fills and the removal of desirable vegetation. Limit large-scale grading to those areas where it is essential to development. Where hillside grading does occur, reshape the terrain in smooth, naturally appearing contours rather than flat, terraced benches. Immediately replant and reseed graded areas to reduce soil loss.

[12] Pursuant to Open Space Action 1.1.1.

In addition, the 1974 Environmental Hazards Element of the General Plan contains policies to ensure "a reasonable level of safety from geologic [and] seismic … hazards within Oakland" (General Policy 1); avoid construction on "known faults or land subject to landslides, erosion, or flooding" (Geologic Hazards Policy 1); discourage development on slopes greater than 30 percent (Geologic Hazards Policy 3); "utilize lands subject to severe seismic and geologic hazards for low intensity park and recreational activities or open space" (Seismic Hazards Policy 2); and "not locate public facilities for human occupancy in fault zone areas unless all other available sites are infeasible" (Seismic Hazards Policy 3).

IV.E.3 Impacts and Mitigation Measures

IV.E.3.1 Significance Criteria

The potential exposure of LBNL projects to unstable geologic and soil conditions would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the CEQA Guidelines and the UC CEQA Handbook:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area, or based on other substantial evidence of a known fault (refer to CGS Special Publication 42);
  - Strong seismic groundshaking;
  - Seismic-related ground failure, including liquefaction; or
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the California Building Code, creating substantial risks to life or property; or
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of wastewater.

IV.E.3.2 Impact Assessment Methodology

This section describes the potential geology and soils impacts resulting from implementation of the proposed 2006 LRDP, based on the Standards of Significance. Potential impacts were analyzed based on existing site data and the generalized scope of facility development analyzed in this EIR. LBNL will evaluate whether the geology and soils impacts of any later activity implemented pursuant to the LRDP were examined in this program EIR before determining what appropriate level of tiered project-specific CEQA analysis might be necessary, or whether the scope of the future activity were to fall within the scope of the analysis covered by the program EIR. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3).

Significance criteria associated with installation of septic tanks or alternative waste disposal systems are not relevant to the proposed project, as septic tanks or alternative waste disposal systems are not proposed; thus, there would be no potential impacts associated with the capability of onsite soils to support these uses.

IV.E.3.3 2006 LRDP Principles, Strategies and LBNL Design Guidelines

2006 LRDP Principles and Strategies

The 2006 LRDP proposes four fundamental principles that form the basis for the Plan's development strategies provided for each element of the LRDP. The principle most applicable to geology and soils as related to new development is to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship" and to "Build a more campus-like research environment."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP (see Chapter III, Project Description for further discussion, and see Appendix B for a full listing of principles, strategies and design guidelines). Development Strategies set forth in the 2006 LRDP applicable to geology and soils include the following:

- Protect and enhance the site's natural and visual resources, including native habitats, streams and mature tree stands by focusing future development primarily within the already developed areas of the site.
- Increase development densities within the most developed areas of the site to preserve open space, enhance operational efficiencies and access.
- To the extent possible site new projects to replace existing outdated facilities and ensure the best use of limited land resources.
- To the extent possible site new projects adjacent to existing development where existing utility and access infrastructure may be utilized.
- Site and design new facilities in accordance with University of California energy efficiency and sustainability policy to reduce energy, water and material consumption and provide improved occupant health, comfort and productivity.

- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory.
- Reduce the percentage of parking spaces relative to the adjusted daily population.
- Consolidate parking into larger lots and/or parking structures, locate these facilities near Laboratory entrances to reduce traffic within the main site.
- Remove parking from areas targeted for outdoor social spaces and service areas.
- Consolidate service functions wherever possible in the Corporation Yard.
- Preserve and enhance the native rustic landscape and protect sensitive habitats.
- Minimize impervious surfaces to reduce storm water run-off and provide landscape elements and planting to stabilize slopes, reduce erosion and sedimentation.
- Consolidate utility distribution into centralized utility corridors that generally coincide with major roadways.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP. The LBNL Design Guidelines are proposed to be adopted by the Lab following The Regents’ consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the Plan’s development strategies as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provide the following specific planning and design guidance relevant to geologic resources:

- Minimize impacts of Disturbed Slopes.
- Reduce the amount of impermeable surfaces at the Lab.

IV.E.3.4 Impacts and Mitigation Measures

Impact GEO-1: Future construction projects within the Alquist-Priolo Zone could expose people or structures to surface fault rupture. (Significant; Less than Significant with Mitigation)

The western edge of LBNL is located within a CGS-designated Alquist-Priolo Zone for the northern segment of the Hayward fault, one of the major active faults in the San Andreas System. The eastern limit of the Alquist-Priolo Zone passes through LBNL near the Blackberry Canyon entrance, as shown in Figure IV.E-4, p. IV.E-12 (CGS, 1982a and 1982b).

Future construction within the Alquist-Priolo Zone would require additional Fault Rupture Hazard Investigations, in compliance with CGS Publication 49, *Guidelines for Evaluating the Hazard of Surface Fault Rupture* (CGS, 1997a). Proposed facility placement would be restricted based on the results of these studies, which would effectively prevent the siting of structures on known, active traces of the Hayward fault. Compliance with the requirements of the CGS and the Alquist-Priolo Act would minimize potential fault rupture hazards associated with new construction of facility space to a less-than-significant level, as the entire purpose of the act is to avoid risk due to construction atop an active fault; hence the requirement for specific studies within the Alquist-Priolo Zones.

Nevertheless, ancillary features of LBNL, such as parking lots, roadways, sidewalks, and utility infrastructure, are not bound by the restrictions of the Alquist-Priolo Act. Construction of these features within the Alquist-Priolo Zone could result in significant hazards, primarily if they were to result in complications during emergency conditions. Should fault rupture occur following an earthquake on the Hayward fault, potential damage could include damaged utilities, cracked pavement or roadway failure, which could hinder or prevent emergency access to LBNL through the Blackberry Canyon entrance.

In addition to the active Hayward fault, the Wildcat fault passes through the LBNL site. Potential fault rupture hazards associated with Wildcat fault are considered less than significant, as the fault has not displayed evidence of fault activity during the Holocene (11,000 years to the present) and is not classified as active under the Alquist-Priolo Act.

> **Mitigation Measure GEO-1:** Seismic emergency response and evacuation plans for LBNL shall incorporate potential inaccessibility of the Blackberry Canyon entrance and identify alternative ingress and egress routes for emergency vehicles and facility employees in the event of roadway failure from surface fault rupture.
>
> Implementation of the above mitigation measure would reduce potential impacts associated with surface fault rupture on the Hayward fault to a less-than-significant level.
>
> **Significance after Mitigation:** Less than significant.

Project Variant. The project variant would alter the on-site adjusted daily population but would not result in any change in demolition or new construction compared to what is contemplated under the LRDP. Therefore, the surface fault rupture impacts of future construction projects associated with the project variant would be the same as those described for the LRDP.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of surface fault rupture impacts related to future construction projects.

The Illustrative Development Scenario shows the proposed sites of a new building, S-1, and a parking structure PS-1, as being located at least partially within the Alquist-Priolo Zone shown in

Figure IV.E-4. As noted above, specific fault trace studies would be required prior to construction of the two newly identified structures in the Alquist-Priolo Zone (as was the case with the previously approved Building 49), and construction would not be permitted if active fault traces were identified. Therefore, no construction would be permitted atop traces of the Hayward fault, and potential fault rupture hazards associated with these two projects would be less than significant. Other potential future projects under the LRDP such as those identified in the Illustrative Development Scenario might expose people or structures to surface fault rupture for the reasons stated above regarding full implementation of the LRDP. With implementation of Mitigation Measure GEO-1, other future projects identified in the Illustrative Development Scenario that might expose people or structures to surface fault rupture would be less than significant.

Impact GEO-2: Implementation of the LRDP would expose people and structures to seismic hazards such as groundshaking and earthquake-induced landsliding. (Significant; Less than Significant with Mitigation)

As described earlier, the Working Group on California Earthquake Probabilities has concluded there is a 62-percent probability of at least one magnitude 6.7 or greater quake striking the San Francisco Bay Area before 2032. The LBNL site could experience a range of groundshaking effects during an earthquake on one of the active earthquake faults in the Bay Area. Excessive groundshaking could also cause secondary ground failure, such as seismically induced landslides or differential settlement, which could expose people to the risk of injury and cause structural damage to buildings.

Due to the proximity of LBNL to Hayward fault, levels of groundshaking as strong as Very Violent (Modified Mercalli Intensity X) are possible. Groundshaking intensities from a major seismic event on the Hayward fault could generate ground motion approaching or exceeding a peak ground acceleration of 0.7 g. Additionally, portions of LBNL are located within a CGS-designated Seismic Hazard Zone for earthquake-induced landslides, and numerous historic landslide areas are present throughout the site, some of which LBNL has identified as “high risk” for future instability.

Construction under the 2006 LRDP would comply with requirements of the 2001 California Building Code (or future editions relevant to the date of project planning and construction), University of California seismic design safety policies, LBNL’s Facilities Department Project and Design Management Procedures Manual *Lateral Force Design Criteria*, and federal standards. Design of LBNL structures under the LRDP would therefore exceed the requirements of the California Building Code (CCR Title 24) and comply with the more stringent local building code (LBNL Standard RD 3.22). Sites located within the CGS Seismic Hazard Zone for landsliding would be required to comply with CGS Publication 117, *Guidelines for Evaluating and Mitigating Seismic Hazards*. Under such design requirements, buildings at LBNL would be designed to withstand a force of a magnitude 7+ earthquake on the Hayward fault or a magnitude 8.3 earthquake on the San Andreas fault without collapse.

Mitigation Measure GEO-2: A site-specific, design-level geotechnical investigation shall occur during the design phase of each LBNL building project, and prior to approval of new building construction within the LBNL hill site. This investigation shall be conducted by a licensed geotechnical engineer and include a seismic evaluation of potential maximum ground motion at the site. Geotechnical investigations for sites within either a Seismic Hazard Zone for landslides or an area of historic landslide activity at LBNL, as depicted on Figures IV.E-2 and IV.E-3, or newly recognized areas of slope instability at the inception of project planning, shall incorporate a landslide analysis in accordance with CGS Publication 117. Geotechnical recommendations shall subsequently be incorporated into building design.

Earthquakes and groundshaking in the Bay Area are unavoidable and may occur at some time during the period covered by the LRDP. Although some structural damage is typically not avoidable, building codes and local construction requirements have been established to protect against building collapse and to minimize injury during a seismic event. Considering that the future individual buildings would be constructed in conformance with the California Building Code, LBNL requirements, federal regulations and guidelines, and Mitigation Measure GEO-2, the risks of injury and structural damage from groundshaking and earthquake-induced landsliding would be reduced and the impacts, therefore, would be considered less than significant.

Furthermore, as described in the Project Description, some of the buildings constructed pursuant to the LRDP would be occupied by staff relocated from other, older LBNL facilities, some of which were constructed in accordance with less stringent building code requirements than those that would apply to future construction. As of 2003, 14 percent of LBNL buildings were over 60 years old. Many of these buildings were constructed as temporary structures that were never replaced. The LRDP specifically proposes the demolition of some 30 outdated buildings that together include approximately 250,000 square feet. In this regard, implementation of the LRDP would result in a beneficial seismic safety impact.

Significance after Mitigation: Less than significant.

Project Variant. The project variant would alter the on-site adjusted daily population but would not result in any change in demolition or new construction compared to what is contemplated under the LRDP. Therefore, construction effects associated with the project variant would be the same as those described for the LRDP.

With implementation of Mitigation Measure GEO 2, impacts of the project variant related to exposure of people and structures to seismic hazards such as groundshaking and earthquake-induced landsliding would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP.

Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of seismic hazards such as groundshaking and earthquake induced landsliding. Potential future projects under the LRDP such as those identified in the Illustrative Development Scenario would expose people and structures to seismic hazards such as groundshaking and earthquake-induced landsliding for the reasons stated above. With implementation of Mitigation Measure GEO-2, this impact of a potential project identified in the Illustrative Development Scenario would be reduced to a less than significant level.

Impact GEO-3: Implementation of the LRDP would result in construction on soils that could be subject to erosion and instability. (Significant; Less than Significant with Mitigation)

The southern portion of the site is underlain by Altamont Clay, soil that is subject to shrink-swell hazards. Future excavation, grading, and construction activities at LBNL, particularly on sloped sites, could result in soil erosion or create slope instability. Compliance with California Building Code standards and Mitigation Measure GEO-2 would require the development of a site-specific geotechnical report for future building development that identifies potential hazards posed by site soils (such as expansiveness) and recommends appropriate measures to minimize these hazards. Additionally, construction-related grading and other activities would comply with the Association of Bay Area Governments' (ABAG) *Manual of Standards for Erosion and Sediment Control Measures* (ABAG, 1995), and the California Stormwater Quality Association's (CASQA) *Stormwater Best Management Practice Handbook for Construction* (CASQA, 2003) (or subsequent editions thereof).

> **Mitigation Measure GEO-3a:** Construction under the LRDP shall be required to use construction best management practices and standards to control and reduce erosion. These measures could include, but are not limited to, restricting grading to the dry season, protecting all finished graded slopes from erosion using such techniques as erosion control matting and hydroseeding or other suitable measures.
>
> **Mitigation Measure GEO-3b:** Revegetation of areas disturbed by construction activities, including slope stabilization sites, using native shrubs, trees, and grasses, shall be included as part of all new projects.
>
> Compliance with California Building Code standards and compliance with Mitigation Measures GEO-2, GEO-3a, and GEO-3b would reduce potential impacts associated with expansive soils and soil erosion to a less-than-significant level.
>
> **Significance after Mitigation:** Less than significant.

Project Variant. The project variant would alter the on-site adjusted daily population but would not result in any change in demolition or new construction compared to what is contemplated under the LRDP. Therefore, construction effects associated with the project variant would be the same as those described for the LRDP. Compliance with California Building Code standards and implementation of Mitigation Measures GEO-2, GEO-3a, and GEO-3b would reduce potential impacts associated with expansive soils and soil erosion to a less-than-significant level.

Individual Future Projects/ Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of erosion and instability impacts. For the reasons stated above, potential future construction projects under the LRDP such as those identified in the Illustrative Development Scenario would expose people or structures to geologic hazards such as expansive soils. Future construction projects, including earthmoving activities that involve excavation and grading, could also result in soil erosion. Compliance with California Building Code standards and implementation of Mitigation Measures GEO-2, GEO-3a, and GEO-3b would reduce potential impacts of a future construction project identified in the Illustrative Development Scenario to a less-than-significant level.

IV.E.3.5 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex—housing the Bevatron accelerator—although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Additional projects currently underway at UC Berkeley, described in Section VI.C of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis includes the City of Berkeley and the areas of northern Alameda and western Contra Costa counties proximate to the northern segment of the Hayward fault. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.E-19) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative geology impacts to rise to the level of significance.

Impact GEO-4: The proposed 2006 LRDP, when combined with cumulative growth, would increase the population exposed to geologic and seismic hazards. (Less than Significant)

Development pursuant to the 2006 LRDP, along with development at UC Berkeley under the campus' 2020 LRDP, would increase both the population and employment concentration in the area of northeastern Berkeley and Oakland that is occupied by the UC Berkeley campus and the LBNL hill site. In addition, other cumulative development in the surrounding area could result in population growth of approximately 13 percent in Berkeley and 20 percent or more in northern Alameda County and western Contra Costa County by 2025 (see Section IV.J, Population and Housing, for more information). Together, this cumulative growth would increase the population in the Bay Area, and particularly in proximity to the Hayward fault, that would be subject to strong groundshaking in a major earthquake. Additionally, cumulative hillside development, either in the UC Berkeley hill area or on private property in the Oakland-Berkeley hills, would increase the number of persons at risk of seismically induced landslides and other potential slope-related hazards.

However, these hazards would be mitigated to the extent practicable through implementation of and compliance with adopted General Plan policies, building codes, and regulations. It is not possible to eliminate the risk from construction in earthquake-prone areas, nor is it possible to fully avoid all geologic hazards. The State of California and local jurisdictions have limited power to prohibit construction on private lands, except in the case of the most seismically or geologically at-risk lands. As noted above, earthquakes and groundshaking in the Bay Area are unavoidable and, while some structural damage may not be preventable, building codes and local construction requirements have been established to protect against building collapse and major injury during a seismic event. Construction in conformance with the California Building Code, local building codes, where applicable, and other pertinent regulations and guidelines would reduce the risks of injury and structural damage from groundshaking, earthquake-induced landsliding, and other seismic and geologic hazards to a less-than-significant level. Moreover, the LBNL LRDP, while it would result in some increased employment on the Lab main site, would not directly result in increased population in the Bay Area that would be subject to earthquake hazards. To the extent that the LRDP could indirectly increase the local population subject to earthquake hazards, the increase would not be considerable in the context of Bay Area population and regional growth, and therefore the cumulative impact would not be significant.

The EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) finds that the SCIP would result in significant unavoidable impacts due to the presence of the Hayward fault, which traverses the SCIP site and runs below Memorial Stadium (UC Berkeley, 2006). However, because these impacts would be the direct result of the SCIP being undertaken within an active fault zone, the LBNL 2006 LRDP would not contribute to this site-specific impact, and therefore cumulative impacts would be less than significant.

Mitigation: None required for cumulative impacts, although Measures GEO-1, GEO-2, GEO-3a, and GEO-3b would be implemented, as identified above.

Project Variant. Although, when combined with cumulative growth, the project variant would increase the population exposed to geologic and seismic hazards, the cumulative impact would be less than significant for the reasons stated above. Although no mitigation would be required, Mitigation Measures GEO-1, GEO-2, GEO-3a, and GEO-3b would be implemented, as identified above.

Illustrative Development Scenario/Potential Future Projects. A future project identified in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development, would also, for the reasons stated above, result in a cumulative impact associated with an increase in the population exposed to geologic and seismic hazards that would be less than significant.

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IV.F. Hazards and Hazardous Materials

IV.F.1 Introduction

Potential exposure to hazards and hazardous materials could result from continued University operation of LBNL under the 2006 LRDP, including continued facility development. This section discusses existing hazards and hazardous materials at the project site and analyzes the potential for the LRDP to increase the use, generation, and disposal of or exposure to hazards and hazardous materials, focusing on existing site conditions and anticipated future demolition, construction, and laboratory activities. The characteristics of the site and surrounding areas are also described and discussed with respect to wildland fire hazards.

IV.F.2 Setting

IV.F.2.1 Hazards and Hazardous Materials

Numerous hazardous materials, including radioactive materials,[1] volatile organic compounds, acids, solvents, and petroleum products, are used within LBNL in laboratory activities and/or facility operations (such as maintenance). The transportation, use, storage, treatment, and disposal of these materials can expose individuals or the environment to health and/or environmental hazards. LBNL complies with applicable federal, state, and local laws and regulations. Additional information regarding these materials, associated potential health hazards, and regulatory requirements is provided in the Regulatory Environment section, p. IV.F-9.

Hazardous Materials

The term “hazardous material” is defined as any material that, because of quantity, concentration, or physical or chemical characteristics poses a significant present or potential hazard to human health and safety or to the environment.[2] Hazardous materials are grouped into the following four categories, based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases).[3] Hazardous materials are commonly used in research laboratories and commercial, agricultural, and industrial applications, as well as in residential areas to a limited extent. Hazardous materials at LBNL are used and are present in hazardous and mixed wastes (i.e., radioactive wastes with hazardous waste components) resulting from these uses.

Radioactive materials are used in a variety of research activities at LBNL, including studies that investigate the dynamics of living cells, trace the movement of chemicals through ecological systems, and determine how they react in the environment and the human body. In addition to research, radionuclides at LBNL are present in analytical laboratories and in radioactive and

1 Radioactive material is any material or combination of materials that spontaneously emit ionizing radiation. The rate at which radioactive materials emit radiation is measured in Curies (Ci); one Curie is defined as 37 billion disintegrations per second, or approximately the radioactivity of one gram of radium.

2 State of California, Health and Safety Code, Chapter 6.95, Section 25501(o).

3 Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Article 3.

mixed waste and are produced as a by-product of accelerator operations. Radiochemical and radiobiological studies performed at LBNL typically use small quantities of radionuclides, measured in millicuries.[4] A wide variety of radionuclides is used at LBNL. Table IV.F-1 lists the most important of these and their decay characteristics.

TABLE IV.F-1
MAJOR RADIONUCLIDES USED AT BERKELEY LAB[a]

Nuclide Name (atomic number)	Symbol	Principal Radiation Types	Half-Life[b]
Carbon (6)	^{11}C	positron	20.4 minutes
Fluorine (9)	^{18}F	positron	1.8 hours
Hydrogen/Tritium (1)	^{3}H	beta	12.3 years
Iodine (53)	^{123}I ^{125}I	gamma gamma	13.2 hours 59.4 days
Nitrogen (7)	^{13}N	positron	10.0 minutes
Phosphorus (15)	^{32}P	beta	14.3 days
Sulfur (16)	^{35}S	beta	87.2 days
Technetium (43)	^{99m}Tc	gamma	6.0 hours
	^{99}Tc	beta	213,000 years

a For a complete list of radionuclides evaluated under NESHAP regulations, see the Radionuclide Air Emission Annual Report for 2005, found on Berkeley Lab's Environmental Services Group home page at http://www.lbl.gov/ehs/esg/tableforreports/assets/nesh05.pdf.
b The half-life is the time required for the disintegration of one-half of the radioactive atoms present when measurement begins.

Hazardous, Radioactive and Medical Waste

LBNL stores, treats, and prepares for disposal hazardous, radioactive, and mixed wastes at its Hazardous Waste Handing Facility. A hazardous waste is generally defined as any hazardous material that is discarded, abandoned, or recycled. The criteria that render a material hazardous also make a waste hazardous.[5] The transportation, use, storage, treatment, and disposal of hazardous wastes, as well investigation and remediation of historical releases of hazardous materials to the environment, are closely regulated under a permitting program administered by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC).

The current permit for LBNL's Hazardous Waste Handling Facility (HWHF) was approved by DTSC on May 4, 1993, and was valid until May 2003. LBNL submitted a permit-renewal application for operation of this facility within the time frame mandated by regulations and

4 A millicurie is one-thousandth of a curie.
5 California Health and Safety Code, Section 25151.

operations continue under an extension of the existing permit until a new permit is issued. The permit authorizes storage and treatment of certain hazardous and mixed wastes.

LBNL has an additional hazardous waste permit to operate five fixed treatment units (FTUs). The FTUs are operated independently of the HWHF, and the City of Berkeley administers the FTU permitting program under its Certified Unified Program Agency program authority (see Regulatory Environment discussion, below). The type and location of each unit are listed in Table IV.F-2.

TABLE IV.F-2
LBNL FIXED TREATMENT UNITS (FTUS)

FTU	Building	Description of Treatment
002	25	Metals precipitation and acid neutralization
003	76	Oil/water separation
004	70A/70F	Acid neutralization
005	2	Acid neutralization
006	77	Metals precipitation and acid neutralization

In October 1995, DTSC approved the Laboratory's Mixed Waste Site Treatment Plan (LBNL, 2006; p. 3-15), which documents the plan and schedule for treatment of the hazardous waste portion of LBNL mixed waste prior to land disposal. The Laboratory prepares an annual report that quantifies the amount of mixed waste in storage at the end of the reporting period.

Transportation, use, storage, treatment and disposal of LBNL radioactive wastes and the radioactive portions of LBNL mixed wastes are closely regulated by DOE and its regulations. DOE also closely regulates the investigation and remediation of historical releases of radioactive materials to the environment.

LBNL also generates medical waste. A substance is considered a medical waste[6] if it is composed of waste generated or produced as a result of diagnosis, treatment, or immunization of human beings or animals, or the production or testing of biologicals,[7] and is either a biohazardous waste or a sharps waste.[8] LBNL sends medical waste to off-site vendor facilities for treatment. Under the state's program, LBNL is considered a large-quantity generator because it generates more than 91 kilograms (200 pounds) of medical waste each month.

6 Medical waste includes materials generated or produced from diagnosis, treatment, or immunization of human beings or animals, or research pertaining to those activities (California Health and Safety Code, Section 117690).

7 The term "biologicals" means medicinal preparations made from living organisms and their products, including but not limited to serums, vaccines, antigens, and antitoxins (California Health and Safety Code, Section 117690).

8 The term "sharps waste" refers to any device having acute rigid corners, edges, or protuberances capable of cutting or piercing, including but not limited to hypodermic needles and broken glass items (such as pipettes and vials) contaminated with biohazardous waste (California Health and Safety Code, Section 117755).

LBNL's waste management program sends hazardous, mixed, medical and radioactive waste generated at the Laboratory off-site for treatment and disposal. Specific low-level aqueous wastes at Berkeley Lab (containing only radioisotopes with short half-lives) are stored until the radioactivity has decayed to undetectable levels; then the wastes are discharged in conformance with a wastewater discharge permit issued by the East Bay Municipal Utility District.

Existing Structures

Existing buildings at LBNL range in age from less than 10 years to over a half century old. Some 30 outdated structures could be demolished under the LRDP, including the Bevatron complex (Building 51/51A). (As previously described, the Bevatron is currently being considered for demolition under the 1987 LRDP EIR, as amended, but is also considered in this EIR for the purpose of analysis.) Structural demolition or renovation could involve exposure to hazardous materials historically used or present in these structures, such as lead-based paint, asbestos, polychlorinated biphenyls (PCBs), and/or radioactive materials. Prior to demolition or renovation of buildings where such hazards may exist, the Laboratory ensures that surveys are performed to determine the types and locations of hazards, and establishes procedures to safely perform this work.

Asbestos is a naturally occurring fibrous material used as a fireproofing and insulating agent in building construction before such uses were banned by the U.S. Environmental Protection Agency (EPA) in the 1970s. Lead-based paint was commonly used on interior and exterior surfaces prior to 1978, when its use was banned by the EPA. PCBs are organic oils that were formerly placed in many types of electrical equipment, including transformers and capacitors, primarily as electrical insulators. In 1979, the EPA banned the use of PCBs in most new electrical equipment and began a program to phase out certain existing PCB-containing equipment. Fluorescent lighting ballasts manufactured after January 1, 1978 do not contain PCBs and are required to have a label clearly stating that PCBs are not present in the unit. Radioactive materials were discussed earlier.

Aboveground Storage Tanks

LBNL has over two dozen aboveground storage tanks (ASTs) that contain petroleum products, with capacities ranging between 50 gallons and 6,000 gallons (LBNL, 2006c). LBNL also has numerous non-petroleum ASTs associated with the FTUs described above, as well as storage drums associated with waste accumulation areas and product distribution areas.

Underground Storage Tanks

Six underground storage tanks (USTs), with capacities between 1,000 gallons and 10,000 gallons, are currently in use at LBNL for gasoline or diesel storage. Since 1993, LBNL has removed nine USTs formerly used for storage of kerosene, diesel, and gasoline. Two USTs have been abandoned in place: one diesel tank located at Building 88 and one gasoline tank at Building 46A. LBNL has received case closure from the City of Berkeley for all abandoned or removed USTs (LBNL, 2006c; LBNL, 2003d).

Soil and Groundwater Contamination

LBNL identified areas of soil and groundwater contamination that existed as a result of historical releases of hazardous materials into the environment. The primary chemical constituents of concern are volatile organic compounds, mostly degreasing solvents used to clean equipment. Other detected constituents include PCBs, petroleum hydrocarbons, and very small amounts of polynuclear aromatic hydrocarbons, semivolatile organic compounds, and metals. The principal radioactive contaminant is tritium. These areas of soil and groundwater contamination are all confined within the boundary of LBNL's main hill site. The geographic extent of groundwater contaminant plumes at LBNL and primary constituents of concern are shown on Figure IV.F-1. The locations and extent of these plumes have been determined using more than 300 wells over a period of more than 14 years.

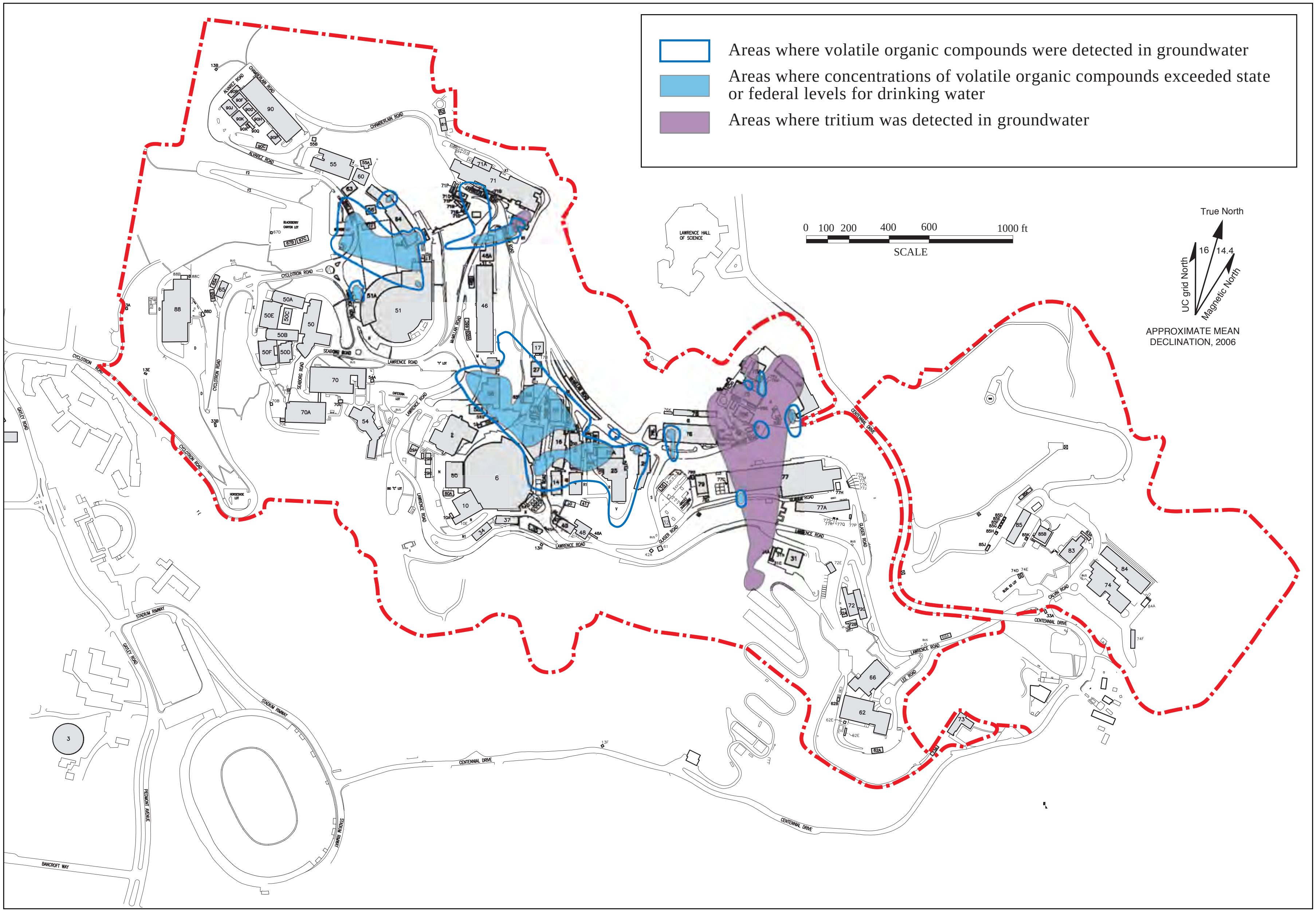
All areas of soil contamination have been cleaned up to levels consistent with Berkeley Lab operations (designated as institutional land use) and acceptable to regulatory oversight agencies.

Currently, there are about 150 groundwater monitoring wells at LBNL, with an additional groundwater monitoring well located off-site. Table IV.F-3 lists of maximum constituent concentrations detected during groundwater sampling activities in 2005 and the associated drinking water standard, if one exists.[9] Groundwater under the LBNL site is not used as a drinking water source by the Lab or by local utilities, and groundwater contamination is therefore not a threat to the local drinking water supply.

Remediation and monitoring of non-radioactive contamination in groundwater are being conducted under the Resource Conservation and Recovery Act of 1976 Corrective Action Program, while monitoring of a tritium plume in groundwater is being conducted under the Atomic Energy Act. Is should be noted that tritium concentrations in all monitoring wells at the Lab are currently less than the drinking water standard. Following an extensive review by DTSC, which included a public involvement phase, LBNL's proposed corrective measures to remedy soil and groundwater contamination were approved by DTSC on October 20, 2005 (LBNL, 2006b; p. 1). These measures include cleaning up areas of soil contamination, stopping discharge of contaminated groundwater to surface waters, preventing further migration of contaminated groundwater, and cleaning up groundwater contaminations to the drinking water standard. Separate CEQA and NEPA reviews were conducted for these activities by DTSC and the U.S. Department of Energy (DOE), respectively.

Site cleanup activities are coordinated closely with the regulatory oversight agencies. DTSC has the primary responsibility for regulatory oversight of non-radioactive contamination. In addition, the San Francisco Bay Regional Water Quality Control Board (RWQCB) and City of Berkeley have oversight roles with respect to these activities. DOE is responsible for the regulatory oversight of tritium in groundwater. These agencies have been involved in review and approval of various work plans and reports related to these investigation and cleanup activities. LBNL

9 Groundwater at LBNL is not used for human consumption, and the use of drinking water standards is included only as a reference point.



SOURCE: LBNL, 2006

Figure IV.F-1
Groundwater Contaminant Plume Map

TABLE IV.F-3
2005 GROUNDWATER CONSTITUENT CONCENTRATIONS AT LBNL

Constituent	Range of Concentrations	Drinking Water Standard
Metals	Listed in µg/L[1]	Listed in µg/L
Antimony	4	6
Arsenic	76	10
Barium	1,200	1,000
Beryllium	Not detected	4
Cadmium	Not detected	5
Chromium	18	50
Hexavalent Chromium	Not detected	50
Cobalt	Not detected	Not specified
Copper	Not detected	1,000
Lead	1.8	15
Mercury	Not detected	2
Molybdenum	1,000	Not Specified
Nickel	44	100
Selenium	100	50
Silver	Not detected	100
Thallium	Not detected	2
Vanadium	35	Not Specified
Zinc	51	5,000
Volatile Organic Compounds	Listed in µg/L	Listed in µg/L
Benzene	69.5	1
1,4-dichlorobenzene	Not detected	5
p-isopropyltoluene	Not detected	—c
Methyl tert-butyl ether	Not detected	13
Toluene	6.8	150
Xylenes (total)	Not detected	1750
Bromodichloromethane	1.3	80d
Bromoform	Not detected	80d
Carbon tetrachloride	1,900	0.5
Chloroform	40	80d
1,1-dichloroethane	8,560	5
1,2-dichloroethane	20	0.5
1,1-dichloroethene	1,180	6
cis-1,2-dichloroethene	1,010	6
Trans-1,2-dichloroethene	99.3	10
Methylene chloride	500	5
1,1,1,2-tetrachloroethane	55	—
Tetrachloroethene	50,800	5
1,1,1-trichloroethane	13.9	200
1,1,2-trichloroethane	1.8	5
Trichloroethene	33,000	5
1,1,2-trichlorotrifluoroethane (Freon 113)	7.8	1,200
Vinyl chloride	735	0.5
Radioactive Compounds	Listed in Bq/L[2]	Listed in Bq/L
Tritium	788	740[3]

1 µg/L = micrograms per liter.
2 Bq/L = becquerels per liter.
3 740 Bq/L is the approximate equivalent of 2.0 x 10^{-8} Curies (20,000 picocuries) per liter.

SOURCE: LBNL, 2006c.

submits quarterly progress reports to these agencies and meets with them periodically to review the status of these activities. Progress has also been reviewed by the City of Berkeley Community Environmental Advisory Commission and members of the community. Plans and reports of this project are maintained at the Berkeley Public Library and are available at the following LBNL web site: http://www.lbl.gov/ehs/erp/html/documents.shtml.

IV.F.2.2 Fire Hazards

The degree of fire hazard for an area depends on three major components: (1) the natural setting of the wildland or developed area, (2) the degree of human use and occupancy of the wildland or developed area, and (3) the ability of public services to respond to fires that do occur. The eastern boundary of LBNL is located along a portion of the interface between wildlands and developed lands in the East Bay hills. The Laboratory is similar in character to other developed hillside areas in the region as it combines developed lands, groves of trees, and non-irrigated grassland areas. Dry summers desiccate plant materials and make them more prone to burning, and a “fire season” is declared by the state each summer and fall. The fire risk during brief periods of the fall months is even more pronounced when strong offshore winds, often called “Diablo winds,” occur in the East Bay hills. These offshore winds further desiccate fuel material and can drive fire fronts and fire brands at extreme speeds.

These winds contributed to the extensive damage that occurred in the devastating Oakland-Berkeley Hills Fire of October 1991, in which 1,520 acres were burned, 25 people were killed, and 3,469 houses and apartments were damaged or destroyed, with losses totaling approximately $1.5 billion (Oakland Office of Fire Services, 1992). This fire occurred less than one mile to the south of the Laboratory site, in an area with similar Diablo-wind conditions and topographic characteristics as LBNL (i.e., steep wooded canyons with highly flammable vegetation).

Vegetation Management

On average, serious Diablo-wind-driven wildland fires that destroy structures occur in the regional vicinity of LBNL approximately every 20 years. The site where LBNL now is situated last burned in 1923 (LBNL, 2003a). These fire conditions are now well understood. Although these fires can spread over large areas, it has been shown that each structure is at risk of damage for approximately 10 minutes, since during this interval a Diablo-wind-driven fire will typically consume the adjacent fuel. LBNL has reviewed fire histories, worked with fire researchers, and applied computer models to determine how the fuels adjacent to its buildings can be reduced to levels that will not support fire intensities that pose serious risks to the structures. Under LBNL’s vegetation management program, the site is now managed to minimize wildland fire damage to structures. This program provides for annual treatment of vegetation on the Laboratory site (except in the Limited Management Area; see below) such that ground fuels cannot produce flame heights in excess of 3 feet (and ground plantings within 10 feet of buildings and roadways produce even lower flame heights); trees are “limbed up” so that flammable branches are at least 8 to 10 feet above the ground, and bushes that would allow ground-based fires to rise into tree canopies are removed.

Firefighting Resources

LBNL provides firefighting services through a service contract with the Alameda County Fire Department, which staffs a fire station on the LBNL grounds (Alameda County Station 19 is located at LBNL Building 48). At least four firefighters are on duty at all times. Equipment at Station 19 includes one fire engine, one reserve fire engine, a hazardous materials vehicle, and a light-duty four-wheel drive “brush rig” that can be used for low-intensity wildland fires.

LBNL has an automatic aid agreement with the City of Berkeley, which means that the fire engine at Station 19 responds to locations in Berkeley, including the UC Berkeley campus, when the first-due Berkeley Fire Department engine is on another call, and Berkeley Fire Department personnel and apparatus respond to the Lab when Engine 19 – stationed at the firehouse at Berkeley Lab – is on another call. The Alameda County Fire Department has mutual aid agreements with other agencies, including Oakland and the East Bay Regional Park District, which can be activated in the event of a major emergency. As serious Diablo-wind-driven fires typically begin to destroy structures before the arrival of mutual aid suppression forces, the LBNL vegetation management program is designed to provide a level of structural protection that goes beyond the more traditional principle of “defensible space.” Computer simulations and case-study analysis have resulted in strategies to manage fuels, not merely to levels that would allow a firefighter to safely stand adjacent to a building, but also so that the intensity of wildland fires at the Laboratory site would not reach levels that facilitate ignition. Fire intensity is a function of fuel availability and characteristics; therefore, fire behavior can be altered through fuel management. LBNL anticipates that fire intensity on the Lab site would be reduced, and that on-site and mutual aid responders would thus be able to focus attention on fire-front suppression.

IV.F.2.3 Regulatory Environment

LBNL is subject to environmental, health, and safety regulations applicable to the transportation, use, management, and disposal of hazardous materials and wastes. This section provides an overview of the regulatory setting for health and safety at the project site and describes LBNL’s current health and safety policies and procedures.

The primary federal agencies with responsibility for hazardous materials management include the EPA, U.S. Department of Labor Occupational Safety and Health Administration (OSHA), U.S. Department of Transportation (DOT), and DOE. The applicable federal laws, regulations, and responsible agencies are shown in Table IV.F-4 and are discussed in detail in this section. In many cases, California state law mirrors or is more restrictive than federal law, and enforcement of these laws has been delegated to the state or a local agency. In January 1996, the California Environmental Protection Agency adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program). The program has six elements: hazardous waste generators and hazardous waste on-site treatment, underground storage tanks, aboveground storage tanks, hazardous materials release response plans and inventories, risk management and prevention programs, and Unified Fire Code hazardous materials management plans and inventories. The local agency responsible for implementation of the Unified Program is called the Certified Unified Program Agency (CUPA). Since the LBNL

TABLE IV.F-4
FEDERAL LAWS AND REGULATIONS RELATED TO HAZARDOUS MATERIALS MANAGEMENT

Classification	Law or Responsible Federal Agency	Description
Hazardous Materials Management	Emergency Planning and Community Right-to-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act)	Imposes requirements to ensure that hazardous materials are properly handled, used, stored, and disposed of and to prevent or mitigate injury to human health or the environment in the event that such materials are accidentally released.
Hazardous Waste Storage, Handling, and Disposal	Resource Conservation and Recovery Act (RCRA)	Under RCRA, the EPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste from “cradle to grave.”
	Hazardous and Solid Waste Amendments Act	Amended RCRA in 1984, affirming and extending the “cradle-to-grave” system of regulating hazardous wastes. The amendments specifically prohibit the use of certain techniques for the disposal of some hazardous wastes.
Hazardous Materials Transportation	U.S. Department of Transportation (DOT)	The DOT has regulatory responsibility for the safe transportation of hazardous materials. DOT regulations govern all means of transportation except packages shipped by mail (49 Code of Federal Regulations).
	U.S. Postal Service	The Postal Service regulations govern the transportation of hazardous materials shipped by mail.
Occupational Safety	Occupational Safety and Health Administration (OSHA)	OSHA sets standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries (29 Code of Federal Regulations).
Radioactive Materials	Atomic Energy Act	Administered by DOE at LBNL, the act regulates the control and disposal of radioactive material.
	Clean Air Act	The EPA regulates airborne radioactive air emissions.
Biosafety Standards	The U.S. Public Health Service, National Institutes of Health, and Centers for Disease Control and Prevention	Operated under the U.S. Department of Health and Human Services, these agencies establish standards for working with biohazardous materials.
Building Components, Materials, and Equipment (USTs, ASTs, PCBs, and asbestos)	Toxic Substances Control Act (TSCA)	TSCA regulates the use and management of PCBs in electrical equipment, and sets forth detailed safeguards to be followed during the disposal of such items (40 Code of Federal Regulations).
	Resource Conservation and Recovery Act	RCRA establishes requirements for the design, installation, and operation of USTs. The EPA banned the use of asbestos in the 1970s.
	Clean Water Act	The Clean Water Act requires petroleum aboveground and underground storage tank owners to develop a Spill Prevention, Control, and Countermeasures Plan.
	OSHA	OSHA establishes requirements to protect workers during activities that could involve exposure to lead or asbestos.
	Clean Air Act	The EPA establishes requirements to protect the environment during asbestos removal activities.

SOURCE: Environmental Science Associates.

main site is located within the city limits of the City of Berkeley and the City of Oakland, both cities are the designated CUPAs. In order to streamline their oversight of CUPA regulations at LBNL, Berkeley and Oakland have entered into a Memorandum of Understanding that established the City of Berkeley as the lead agency for all CUPA activities (other than emergency release reporting).

Hazardous Materials Management

Federal and state laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment. These laws require hazardous materials users to prepare written plans, such as Hazard Communication Plans and Hazardous Materials Management Plans. Laws and regulations require hazardous materials users to store these materials appropriately and to train employees to manage them safely. A number of agencies participate in enforcing hazardous materials management requirements. The Federal Emergency Planning and Community Right-to-Know Act (EPCRA), enacted as Title III of the Superfund Amendments and Reauthorization Act (SARA), requires facilities handling in excess of designated threshold quantities of hazardous materials to provide hazardous materials, hazardous waste, and emission information to public agencies, and to prepare emergency response plans for accidents or other unauthorized releases of designated threshold quantities of hazardous materials. More stringent emergency response handling is required for facilities handling designated “extremely hazardous substances.” Hazardous materials present in exempt quantities or under the direct supervision of a technically qualified individual are exempt for EPCRA reporting, inventory, and emergency planning requirements.[10] In California, the requirements of SARA Title III are incorporated into the state’s Hazardous Materials Release Response Plans and Inventory Law.[11]

This law is administered by the City of Berkeley through its CUPA program, and requires any business that handles hazardous materials above certain thresholds to prepare a Hazardous Materials Business Plan, which must include the following:

- Details of the facility and business conducted at the site.
- An inventory of hazardous materials that are handled or stored on-site.
- An emergency response plan.
- A safety and emergency response training program for new employees with annual refresher courses.

Although sovereign immunity for federal facilities has not been waived in the federal law, LBNL voluntarily complies with these state requirements as implemented by the City of Berkeley.

10 LBNL has always been below reporting thresholds for Toxic Release Inventory (TRI) reporting under EPCRA. Toxic chemicals used in laboratories are exempt from TRI reporting when used under the supervision of a technically qualified individual. The laboratory activity exemption is intended to reduce the chemical tracking burden by exempting laboratories from tracking small or diffuse quantities of listed TRI chemicals used for experimental purposes.

11 California Health and Safety Code, Section 25500.

The Toxic Substances Control Act (TSCA) also establishes reporting requirements for PCBs. Because LBNL does not have PCB-containing transformers or capacitors that exceed TSCA reporting thresholds, the Laboratory is not required to prepare an annual report documenting PCB activity for EPA.

Hazardous Waste Handling

The federal Resource Conservation and Recovery Act of 1976 (RCRA) created a major new federal hazardous waste "cradle-to-grave" regulatory program administered by EPA. Under RCRA, EPA regulates the generation, treatment, and disposal of hazardous waste, and the investigation and remediation of hazardous waste sites. Individual states may apply to EPA to authorize them to implement their own hazardous waste programs in lieu of RCRA, as long as the state program is at least as stringent as federal RCRA requirements. California has been authorized by EPA to implement its own hazardous waste program, with certain exceptions.

In California, DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste, and the investigation and remediation of hazardous waste sites. The California DTSC program incorporates the provisions of both federal and state hazardous waste laws.

Hazardous Materials Transportation

The DOT regulates the transportation of hazardous materials between states and foreign countries. DOT regulations govern all means of transportation, except that the U.S. Postal Service regulations govern packages sent by mail. DOT regulations are contained in the Code of Federal Regulations (CFR) Title 49 (49 CFR). U.S. Postal Service regulations are found in 39 CFR. The State of California has adopted DOT regulations for the intrastate movement of hazardous materials. In addition, the State of California regulates the transportation of hazardous waste originating in the state and passing out of the state. State regulations are contained in Title 26 of the California Code of Regulations (26 CCR). Both regulatory programs apply in California.

The two state agencies that have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans).

The CHP enforces hazardous material and hazardous waste labeling and packing regulations to prevent leakage and spills of material in transit and to provide detailed information to cleanup crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP, which conducts regular inspections of licensed transporters to assure regulatory compliance. Caltrans has emergency chemical spill identification teams at as many as 72 locations throughout the state that can respond quickly in the event of a spill.

Common carriers are licensed by the CHP, pursuant to California Vehicle Code Section 32000. This section requires the licensing of every common carrier that transports, for a fee, in excess of 500 pounds of hazardous materials at one time, and every carrier, if not for hire, that carries more than 1,000 pounds of hazardous material of the type requiring placards.

Every hazardous materials package type used by a hazardous materials shipper must undergo tests that imitate some of the possible rigors of travel. While not every package must be put through every test, representative packages for any package design must be able to be dropped, fully loaded, onto a concrete floor with no significant leakage; survive a compression test in a stacked configuration with no significant damage or distortion; demonstrate leakproofness when subjected to internal air and/or liquid pressure; and not have package closure mechanisms adversely affected by vibration.

Medical Waste

The storage, treatment, transportation, and disposal of medical waste is regulated under the California Medical Waste Management Act (MWMA; Sections 117600 et seq. of the California Health and Safety Code). Medical waste includes biohazardous waste (e.g., blood and blood-contaminated materials) and “sharps” waste (e.g., needles) produced in research relevant to the diagnosis, treatment, or immunization of human beings or animals or in the production of biological products used in medicine. Within the statutory framework of the MWMA, the Medical Waste Management Program of the California Department of Health Services (DHS) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste generators, off-site treatment facilities, and transfer stations throughout the state. The DHS also oversees all medical waste transporters.

Occupational Safety

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. OSHA is generally responsible for assuring worker safety in the workplace. However, at DOE facilities such as LBNL, the occupational worker safety program is administered by DOE pursuant to the authority provided by the Atomic Energy Act over health and safety at its facilities. Beginning in 2007, DOE will enforce its own Health and Safety Program regulation (10 CFR 851), which includes requirements set forth in the OSHA regulations. DOE enforces OSHA requirements in accordance with a Memorandum of Agreement with OSHA.

OSHA regulations at 29 CFR 1910 and 1926 contain requirements concerning the use of hazardous materials in the workplace and during construction that mandate employee safety training, safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, emergency action and fire prevention plan preparation, and a hazard communication program. The hazard communication program regulations contain training and information requirements, including procedures for identifying and labeling hazardous substances, and communicating hazard information relating to hazardous substances and their handling. The hazard communication program also requires that Material Safety Data Sheets be available to employees, and that employee information and training programs be documented. These regulations also require preparation of emergency action plans (escape and evacuation procedures, rescue and medical duties, alarm systems, and training in emergency evacuation).

The federal OSHA regulations include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. Specific, more detailed training and monitoring is required for the use of carcinogens, ethylene oxide, lead, asbestos, and certain other chemicals listed in 29 CFR. Emergency equipment and supplies, such as fire extinguishers, safety showers, and eye washes, must also be provided and maintained in accessible places.

The OSHA regulations also include extensive, detailed requirements for worker protection applicable to any activity that could disturb asbestos-containing materials, including maintenance, renovation, and demolition. These regulations are also designed to ensure that people working near the maintenance, renovation, or demolition activity are not exposed to asbestos.

Radioactive Materials

Pursuant to the federal Atomic Energy Act, DOE regulates the storage and use of sources of ionizing radiation (radioactive material and radiation-producing equipment) at DOE contractor-managed sites like LBNL. Radiation protection regulations require control of sources of ionizing radiation and radioactive material and protection against radiation exposure. DOE regulations concerning occupational radiation exposure are prescribed in 10 CFR 835, Occupational Radiation Protection. These regulations specify appropriate worker safety precautions and worker health monitoring programs. Radiation protection requirements for the public and the environment are prescribed in DOE Order 5400.5, "Radiation Protection of the Public and the Environment." The use of radioactive materials at LBNL is also subject to EPA radioactive air emission regulations in 40 CFR Part 61, Subpart H, National Emission Standards for Hazardous Airborne Pollutants other than Radon from DOE Facilities (NESHAP). Under this regulation, all potential emission sources are controlled and assessed, and the assessments are reported annually to DOE and EPA. In addition, all use of radioactive materials at LBNL is conducted in accordance with an internal authorization process approved by DOE. Emissions of radioactive material to the environment are monitored as described by LBNL's Environmental Monitoring Plan, which ensures that all Laboratory activities operate within regulatory requirements (LBNL, 2006a).

Radiological emissions from LBNL are less than 1 percent of the EPA regulatory limit of 10 millirem/year.[12]

DOE also regulates radioactive waste and the radioactive portion of mixed waste pursuant to the Atomic Energy Act and DOE Order 435.1, Radioactive Waste Management. Radioactive and mixed wastes are routinely generated from LBNL research activities involving radioisotopes. Routinely generated radioactive waste is staged in radioactive waste accumulation areas at individual generator sites, and subsequently transported to the LBNL HWHF for storage and

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12 In 2005, LBNL emissions were approximately 0.2 percent of this limit. For comparison, 10 millirem is roughly equivalent to the additional radiation a passenger would receive on between two and four round-trip cross-country airline trips (radiation at altitude is higher than on the ground due to the thinner atmosphere providing less shielding from the sun's rays); a medical chest x-ray exposes the patient to between about 20 and 50 millirem (San Luis Obispo County, 2002; Washington University, 2002).

management. Mixed waste is also subject to California hazardous waste regulations and is staged in a mixed waste satellite accumulation area inside the radioactive material area and subsequently transported to the LBNL HWHF for storage and management. Radioactive and mixed waste is either managed on-site through a decay-in-place program or is shipped off-site to a licensed commercial or DOE treatment/disposal facility. Decayed mixed waste is then managed as hazardous waste and shipped off-site to a licensed commercial facility.

In 2000, DOE established a moratorium on the release of volumetrically[13] contaminated metals from radiological areas[14] at DOE facilities, and temporarily suspended the unrestricted release of scrap metal for recycling from such areas. The moratorium remains in place pending the preparation of a programmatic environmental impact statement by DOE. LBNL applies the moratorium to former radiological areas at accelerators (e.g., at the accelerator that was formerly operational at the Bevatron complex), where metals may have become activated by exposure to radiation beams.

Biosafety Standards

Federal (9 CFR 121, 29 CFR 1910.1030, 42 CFR 73) and state (Title 8 CCR, Section 5193) laws establish standards for working with biohazardous materials. A hazardous biological material is any potentially harmful biological material (including infectious agents, oncogenic viruses, and recombinant DNA) or any material contaminated with a potentially harmful biological material. The U.S. Public Health Service, the National Institutes of Health, and the Centers for Disease Control and Prevention operate under the U.S. Department of Health and Human Services. These agencies establish standards for working with biohazardous materials.

Emergency Response

The Federal Emergency Planning and Community Right-to-Know Act of 1986 requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or minimize adverse effects to human health or the environment in the event such materials are accidentally released. California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local government and private agencies. Responding to hazardous materials incidents is one part of this plan. The plan is administered by the State Office of Emergency Services, which coordinates the responses of other agencies, including the California Environmental Protection Agency, the CHP, the Department of Fish and Game, the San Francisco Bay RWQCB, and Alameda County Fire Department. LBNL's on-site fire department provides first response capabilities, if needed, for hazardous materials emergencies.

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13 Volumetric contamination is radioactive contamination that resides in or throughout the volume of an item. This contrasts with surface contamination, which is radioactive contamination that resides on or near the surface of an item.

14 A radiological area is an area designated under 10 CFR 835, for which DOE requires specific measures to be taken, such as access control and monitoring, to protect DOE workers from radiological hazards. A radiological area may or may not contain radioactive materials.

Structural and Building Components

Asbestos

Federal and state laws and regulations (such as OSHA's 19 CFR Parts 1910.1001 and 1926.1101, EPA's NESHAP regulations at 40 CFR 763 61 Subpart M and other asbestos regulations at 40 CFR, California Code of Regulations Title 8, Section 5208, as well as the BAAQMD's Regulation 11, Rule 2) apply to building materials containing asbestos. Inhalation of airborne fibers is the primary mode of asbestos entry into the body, making friable (easily crumbled) materials the greatest health threat. These regulations prohibit emissions of asbestos from asbestos-related manufacturing, demolition, or construction activities; require medical examinations and monitoring of employees engaged in activities that could disturb asbestos; specify precautions and safe work practices that must be followed to minimize the potential for release of asbestos fibers; and require notice to federal and local governmental agencies prior to beginning renovation or demolition that could disturb asbestos.

Polychlorinated Biphenyls

As previously discussed, PCBs are organic oils that were formerly placed in many types of electrical equipment, including fluorescent lighting ballasts. Exposure to PCBs may cause various health effects, and PCBs are highly persistent in the environment. The use and management of PCBs in electrical equipment are regulated pursuant to TSCA (40 CFR 761). These regulations generally require labeling and periodic inspection of certain types of PCB equipment and set forth detailed safeguards to be followed during the disposal of such items. Fluorescent light ballasts that contain PCBs, regardless of size or quantity, are regulated as hazardous waste and must be transported and disposed of as hazardous waste. Ballasts manufactured after January 1, 1978 do not contain PCBs and are required to have a label clearly stating that PCBs are not present in the unit. LBNL has reduced use of PCB-containing equipment in response to TSCA regulations. All TSCA-regulated PCB transformers (PCB concentrations greater than 500 parts per million) have been removed from service and properly disposed. The remaining TSCA-regulated PCB-containing equipment items are four large low-voltage capacitors, containing an estimated total of approximately 170 kilograms (375 pounds) of regulated PCB dielectric fluid (LBNL, 2004b).

Lead

OSHA regulates worker exposure during construction activities that involve paint that contains lead. 29 CFR Part 1926.62 covers construction work where employees may be exposed to lead during such activities as demolition, removal, surface preparation for repainting, renovation, clean-up, and routine maintenance. The OSHA-specified compliance includes, among other things, respiratory protection, protective clothing, housekeeping, special high-efficiency filtered vacuums, hygiene facilities, medical surveillance, and training. Under Title 22 of the California Code of Regulations, waste soil containing lead is considered to be hazardous if it exceeds a total concentration of 1,000 parts per million (ppm) and a soluble[15] concentration of 5 ppm.

15 Susceptible to being dissolved, especially in water.

Aboveground and Underground Storage Tanks

The State Water Resources Control Board (SWRCB) administers the petroleum Aboveground Storage Tank (AST) program. This authority has been delegated to the City of Berkeley as the lead CUPA for LBNL. The AST program covers facilities that store petroleum in a single tank, or multiple tanks with an aggregate capacity in excess of 1,320 gallons, and requires that tank owners or operators file a storage statement, pay a facility fee, and prepare and implement a federal Spill Prevention, Control, and Countermeasure (SPCC) Plan (LBNL, 2002). The SPCC Plan must include procedures, methods, and equipment in place at the facility to prevent discharges of petroleum from reaching navigable waters. The total capacity of LBNL's petroleum ASTs exceeds 1,320 gallons, and LBNL meets the associated AST requirements, including the preparation and implementation of a SPCC Plan. Non-petroleum ASTs are regulated by various authorities, principally the LBNL Fire Marshal, the City of Berkeley, or DTSC, depending upon their contents and location.

The SWRCB also administers the Underground Storage Tank (UST) program in California. State laws governing USTs specify requirements for permitting, construction, installation, leak detection monitoring, repairs, release reporting requirements, corrective actions, clean-up, and closure. Although some of LBNL's USTs are located in Oakland and some are in Berkeley, Oakland and Berkeley have a formal agreement that Berkeley is the lead regulatory agency for all of LBNL's USTs. The City of Berkeley Toxics Management Division enforces applicable regulations, which include permitting and inspection requirements. LBNL's six USTs are permitted by the City of Berkeley.

LBNL Hazardous Materials Plans and Policies

LBNL has developed an Integrated Safety Management (ISM) system that establishes environment, safety, and health policies and procedures to ensure all work is performed safely and in a manner that strives for the highest degree of protection for employees, participating guests, visitors, the public, and the environment, commensurate with the nature and scale of the work. To achieve these goals, LBNL has adopted the following seven ISM principles, which are reflected in the detailed policies and procedures of LBNL. Principal investigators, managers, and supervisors are expected to incorporate these principles into the management of their work activities. While these principles apply to all work, the exact implementation of these principles is flexible and can be tailored to the complexity of the work and the severity of the hazards and environmental risks.

1. <u>Line Management Responsibility for Environment, Safety, and Health</u>. Line management is responsible for the protection of the public, the workers, and the environment. More specifically, LBNL line managers are responsible for integrating environment, safety, and health considerations into work and for ensuring active communication up and down the management line and with the workforce. In addition, line management must also ensure that exposures of workers, the public, and the environment to radiation hazards are kept as low as reasonably achievable.

2. Clear Roles and Responsibilities. Clear and unambiguous lines of authority and responsibility for ensuring environment, safety, and health are established and maintained at all organizational levels within LBNL, and for work performed by its contractors.

3. Competence Commensurate with Responsibilities. Personnel possess the experience, knowledge, skills, and abilities necessary to discharge their responsibilities. LBNL management takes steps to ensure the appropriate depth and breadth of technical talent are available and that LBNL has in place the means for periodically evaluating competencies. Competence includes training, experience, and fitness for duty.

4. Balanced Priorities. Resources are effectively allocated to address environment, safety, and health; programmatic; and operational considerations. Protecting the public, workers, and the environment is a priority whenever activities are planned and performed.

5. Identification of Environment, Safety, and Health Standards and Requirements. Before work is performed, the associated hazards are evaluated and an agreed-upon set of standards and requirements is established. These standards, if properly implemented, provide adequate assurance that the public, workers, and the environment are protected from adverse consequences.

6. Hazard Controls Tailored to Work Being Performed. Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards being performed.

7. Operations Authorization. The conditions and requirements that must be satisfied for operations to be initiated and conducted are clearly established and agreed upon. LBNL PUB-3000, Berkeley Lab's Health and Safety Manual (LBNL, 2003c), outlines a method for ensuring the form and content of authorizations. Examples for LBNL include Radiation Work Authorizations, Activity Hazard Documents, and Safety Analysis Documents. Operating permits are obtained from regulatory agencies for certain activities, including wastewater and storm water discharges, specific air emissions, underground tank storage, and hazardous waste storage and treatment.

In addition, the Laboratory has developed an Environmental Management System (EMS) to implement sound environmental stewardship practices that protect the air, water, land, and other environmental resources potentially affected by facility operations. The EMS is integrated into the Laboratory's ISM processes. DOE Order 450.1, *Environmental Protection Program*, established the requirement for an EMS, including that it be integrated with a facility's ISM. The Laboratory's EMS program is described in the Laboratory's Performance-Based EMS Plan (PUB-3180).

The LBNL Environment, Health, and Safety (EH&S) Division has primary responsibility for developing compliance strategies for federal, state, and local environmental laws and regulations, and for developing related LBNL policies and procedures. In conformance with applicable laws and regulations, the EH&S Division establishes procedures for storage, handling, use, and disposal of hazardous and radioactive materials and medical wastes. These are described in LBNL PUB-3000 and in supporting documents referenced in that document. In addition, LBNL maintains a Hazardous Materials Business Plan that lists the hazardous materials stored in each

LBNL building in quantities that meet or exceed the state's minimum reporting requirements; the plan also summarizes emergency plans, procedures, and training (LBNL, 2006c). Operation of USTs and ASTs within LBNL is required to comply with measures identified in LBNL's SPCC Plan. The EH&S Division also oversees the monitoring and remediation of soil and groundwater affected by historic hazardous material use at LBNL, and ensures regulatory compliance.

LBNL stores chemicals and other hazardous substances in aboveground tanks and storage drums, the latter located at product distribution areas. Hazardous, radioactive, and mixed waste are accumulated at designated Satellite Accumulation Areas and Waste Accumulation Areas in research and support locations through the Laboratory. These are taken to LBNL's HWHF, which collects wastes from laboratories and buildings throughout the site for temporary storage, some forms of treatment as specified by the DTSC-issued permit for the HWHF, and subsequent transport for off-site treatment and disposal. The HWHF operates in accordance with DTSC requirements and oversight applicable to hazardous wastes. In compliance with the operating permit from DTSC, the EH&S Division produces an annual hazardous waste report for DTSC that incorporates treatment and disposal information for all hazardous waste activities, and an annual report of waste generation and pollution prevention progress for DOE that details waste minimization efforts undertaken at the facility (LBNL, 2006c). DOE requirements also apply to the handling of radioactive and mixed waste at the HWHF.

IV.F.2.4 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies contained in the Berkeley and Oakland general plans.

Berkeley General Plan

Berkeley General Plan policies pertaining to hazards and hazardous materials relevant to implementation of the LBNL LRDP include the following:

> Policy EM-13 Hazardous Materials Disclosure: Continue to require the disclosure of hazardous materials usage and encourage businesses using such materials to prepare and implement a plan to reduce the use of hazardous materials and the generation of hazardous wastes.

> Policy EM-14 Hazardous Materials Regulation: Control and regulate the use, storage, and transportation of toxic, explosive, and other hazardous and extremely hazardous material to prevent unauthorized and accidental discharges.

Actions:

A) Regularly inspect businesses using, storing, transporting, or generating hazardous materials or wastes to ensure compliance with federal, state, and local regulations.

B) Require facility operators to write and implement contingency plans in preparation for emergency situations and accidental releases. Additionally, require facilities to train their employees on how to activate the contingency plans.

Policy EM-15 Environmental Investigation: When reviewing applications for new development in areas historically used for industrial uses, require environmental investigation as necessary to ensure that soils, groundwater, and buildings affected by hazardous material releases from prior land uses would not have the potential to affect the environment or the health and safety of future property owners, users, or construction workers.

Policy EM-16 Risk Reduction: Work with owners of vulnerable structures with significant quantities of hazardous material to mitigate potential risks.

Policy EM-17 Warning Systems: Establish a way to warn residents of a release of toxic material or other health hazard, such as sirens and/or radio broadcasts.

Policy EM-31 Landscaping: Encourage drought-resistant, rodent-resistant, and fire-resistant plants to reduce water use, prevent erosion of soils, improve habitat, lessen fire danger, and minimize degradation of resources.

Policy S-23 Property Maintenance: Reduce fire hazard risks in existing developed areas by ensuring that private property is maintained to minimize vulnerability to fire hazards.

Oakland General Plan

The Open Space, Conservation and Recreation Element, adopted in 1996, addresses the management of open land, natural resources, and parks in Oakland. The following policies are relevant to the proposed project:

Policy CO-1.2 Soil Contamination Hazards: Minimize hazards associated with soil contamination through the appropriate storage and disposal of toxic substances, monitoring of dredging activities, and cleanup of contaminated sites. In this regard, require soil testing for development of any site (or dedication of any parkland or community garden) where contamination is suspected due to prior activities on the site.

Policy CO-5.2 Improvements to Groundwater Quality: Support efforts to improve groundwater quality, including the use of nontoxic herbicides and fertilizers, the enforcement of anti-litter laws, the cleanup of sites contaminated by toxics, and ongoing monitoring by the Alameda County Flood Control and Water Conservation District.

IV.F.3 Impacts and Mitigation Measures

IV.F.3.1 Significance Criteria

The impacts of LBNL projects involving hazards and hazardous materials would be considered significant if they would exceed the following Standards of Significance, in accordance with Appendix G of the CEQA Guidelines and the UC CEQA Handbook:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

IV.F.3.2 Impact Assessment Methodology

Potential impacts were analyzed based on data on the existing site and on proposed facility development under the 2006 LRDP. LBNL will evaluate whether the hazards and hazardous materials impacts of any later activity implemented pursuant to the LRDP were examined in this program EIR before approving the activity as being within the scope of the project covered by the program EIR. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3).

Potential impacts associated with air emissions are addressed in Section IV.B, Air Quality, of this document.

Numerous laws and regulations governing environment, health, and safety apply to activities at LBNL. As well, LBNL has policies, programs, and guidance documents implementing these requirements, which in some cases contain protective measures beyond what is required by law.

LBNL also continues to implement mitigation measures set under the 1987 LRDP as amended relevant to environment, health, and safety. Compliance with the above, and with new requirements as they arise, is part of the project for CEQA purposes, and reduces the impacts of the management of hazardous materials, hazardous waste, and other hazards discussed in this section to less-than-significant levels.

IV.F.3.3 2006 LRDP Principles, Strategies, and the LBNL Design Guidelines

2006 LRDP Principles and Strategies

The 2006 LRDP proposes four fundamental principles that form the basis for the Plan's development strategies provided for each element of the Plan. The two principles most applicable to concerns regarding hazards and hazardous materials related to new development are to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship" and to "Build a safe, efficient, and cost-effective scientific infrastructure capable of long-term support of evolving scientific missions."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP (see Chapter III, Project Description for further discussion, and see Appendix B for a full listing of principles, strategies, and design guidelines). Development strategies set forth in the 2006 LRDP applicable to hazards and hazardous materials include the following:

- Protect and enhance the site's natural and visual resources, including native habitats, streams, and mature tree stands by focusing future development primarily within the already developed areas of the site.
- Site and design new facilities in accordance with University of California energy-efficiency and sustainability policies to reduce energy, water, and material consumption and provide improved occupant health, comfort, and productivity.
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory.
- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates.
- Provide separated routes of travel wherever possible for pedestrians and vehicles.
- Eliminate parking from the sides of major roadways, thereby improving safety and allowing one-way roads to be converted to two-way traffic.
- Improve pedestrian access and safety throughout the Laboratory site by developing new routes and enhancing existing routes.
- Develop all new landscape improvements in accordance with the Laboratory's vegetation management program to minimize the threat of wildland fire damage to facilities and personnel.

- Maintain a safe and reliable utility infrastructure capable of sustaining the Laboratory's scientific endeavors.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP. The LBNL Design Guidelines are proposed to be adopted by the Lab following the Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development strategies as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provide the following specific planning and design guidance relevant to hazards and hazardous materials:

- Provide appropriate site lighting for safety and security.
- Minimize impacts of disturbed slopes.
- Segregate public entries and paths from service entries and paths where feasible.
- Where segregation is not possible and service and public access overlap in accessing buildings, design service courts to intelligently serve both.

IV.F.3.4 Construction[16] and Demolition Impacts

Impact HAZ-1: Demolition or renovation of existing structures could expose construction workers, the public, or the environment to hazardous materials in building materials. (Less than Significant)

Development under the LRDP includes the demolition or renovation of some existing structures. Based on the age and nature of the structures, some of these buildings may contain non-radioactive hazardous materials or radioactivity. In general, the most common non-radioactive regulated building materials that are encountered during demolition and renovation are lead-based paint, asbestos, and light ballasts containing PCBs.

Demolition and renovation activities, including removal of walls, sanding, welding, and material disposal, potentially could expose on- and off-site receptors to these materials. Compliance with laws, regulations, policies, and procedures described in this chapter, coupled with continuation of the Lab's current management practices, would ensure that exposure of workers and the public resulting from the demolition and renovation of LBNL buildings would result in less-than-significant impacts.

To deal with potential hazards when demolition or renovation is proposed, a survey and/or review of existing data is conducted to determine whether hazardous substances or radioactivity, whether

[16] For the purposes of this EIR, the term "construction," unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

in the building or the subsurface, may be encountered. Hazardous and radioactive substances are handled and, if necessary, removed in accordance with applicable regulations and LBNL procedures (e.g., as specified by LBNL's Asbestos Management, Lead Compliance, and Radiation Protection Programs).

The LBNL Facilities Division has developed detailed project specifications that are required of all subcontractors performing various activities, including demolition (LBNL, 2003e). These specifications include requirements that subcontractors meet applicable environmental, health, and safety regulations and LBNL requirements, and that subcontractor employees receive an initial EH&S orientation prior to performing work. If required to work in certain areas, such employees must attend a more specific safety training session, for example, for work in radiation areas, and meet the requirements of LBNL authorization documents, such as a Radiation Work Permit. Subcontractors are also subject to requirements for reporting spills of hazardous substances or wastes to the LBNL project manager. LBNL project managers and/or assigned delegates periodically monitor subcontractor compliance with these and other EH&S requirements.

One category of materials that may be encountered during demolition and renovation activities is items from former accelerator facilities. As described elsewhere in this EIR, LBNL plans to demolish the former accelerator facility at Building 51. Certification of the Building 51 (Bevatron) EIR and approval of the demolition project are anticipated to be considered in early 2007. Extensive modifications may be made to other accelerator facilities, such as the one formerly located at Building 71. Such facilities contain a wide variety of items that may require reuse, recycling, or disposal, either during the operation of the facilities or after their closure. These items include hundreds of multi-ton concrete shielding blocks that were installed to protect workers from exposure to radiation; concrete in floors and foundations; beamline components; and miscellaneous equipment. LBNL has sent thousands of tons of blocks and lesser quantities of other items to off-site recipients for disposal or reuse, recycling, and would continue these activities under the LRDP.

As a result of accelerator operations, some of the above items contain low amounts of radioactivity, which are measured at levels that are above the levels found in nature. (This is termed "residual radioactivity," which means radioactivity above detection limits that has been added as a result of a DOE activity.) For the most part, this residual activity was produced when energetic particles from the accelerator activated a small fraction of the elements in these items. Also, some of the items might have surface radioactivity, due to releases from radioactive targets that were used in some accelerator experiments.

There is no detectable residual radioactivity in a substantial fraction of the concrete and other items at these facilities (LBNL, 2003b). Such materials can be sent off-site for disposal, reused, or recycled by government agencies and private sector parties without restrictions, with the exception of metals subject to the DOE Metals Moratorium discussed above. In the case of concrete blocks, reuse options include shielding at other accelerators, and soil stabilization. If reuse or recycling is not feasible, non-radioactive concrete and other non-radioactive materials can be sent to landfills that accept these types of materials. Prior to release for shipment off-site, concrete blocks are screened according to a DOE-approved protocol, such as the EH&S Division's Protocol for Survey and Release of Bevatron & Building 51 Materials. Concrete debris from floors and foundations, should these be made available for release in the future, would be surveyed and handled in a manner similar to that used for blocks.

Regarding metals and other types of materials from accelerator facilities, items from former radiological areas as defined by 10 CFR 835 require screening prior to release. External radiation measurements are taken of each such item, using appropriate survey instrumentation and/or swipe samples. Items from other, non-radiological areas are not required to undergo such screening.

Another recycling option for concrete with no detectable residual radioactivity is to send it to commercially operated off-site locations that break concrete into rubble. Alternately, rubbling equipment could be temporarily set up at LBNL and the concrete rubbled on-site. Rubbling offers transportation advantages, as rubbled material is more efficient in filling the volume capacity of trucks, which would decrease the number of truck trips generated in hauling concrete to subsequent destinations, compared with hauling unbroken concrete. The resulting rubble could be released for such uses as fill for construction projects and road building, or could be sent to landfills.

Concrete and other items that have detectable residual radioactivity are subject to greater restrictions. Options for these items include leaving them in place, reusing them at LBNL, transferring them to other DOE facilities for reuse, or shipping them to a DOE-authorized facility for disposal as low-level radioactive waste. It is anticipated that approximately 30 percent of the concrete shielding blocks and an as yet unknown percentage of other materials in the Building 51 accelerator might have levels of residual radioactivity that would prevent their release to other than these restricted destinations, except as provided under DOE Order 5400.5, as detailed below.

It is possible that LBNL might, during the period covered by the LRDP, apply to DOE in accordance with DOE Order 5400.5 for approval of reuse or disposal options other than those listed above for concrete containing residual radioactivity. The types of uses that potentially can be approved under this process are similar to those allowed for concrete or other materials without residual radioactivity. However, the specific options that might be proposed to DOE would depend on a detailed analysis of the financial costs and potential radiological impacts of the options concerned, including a plan to maintain radiation doses to the public as low as reasonably achievable.

LBNL currently complies with measures identified in the 1987 LRDP EIR, as amended, to ensure that hazardous materials and wastes are properly stored, used, and generated at the sites in a manner that minimizes exposure of potential hazardous materials to the public and environment. Under the LRDP, LBNL would continue to comply with federal and state laws regulating the use, transportation, and disposal of hazardous material and would continue to develop LBNL project specifications that ensure subcontractors meet applicable environmental, health, and safety regulations. LBNL management protocols would ensure that waste materials from accelerator facilities would be properly disposed or recycled in accordance with federal regulations, depending on the level of residual radioactivity. Compliance with applicable laws, regulations, and policies guiding the use, storage, and disposal of hazardous materials at LBNL would ensure that potential impacts would remain less than significant.

Mitigation: None required.

Project Variant. The project variant would increase the average daily population on the Berkeley Lab hill site, but would not change the projected building square footage. While some buildings could be used in different ways than might be the case under the project as proposed, the variant would not result in appreciably different hazard impacts with regard to building demolition or renovation.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of hazard impacts of construction. Effects due to demolition or renovation of potential structures under the LRDP such as those denoted in the Illustrative Development Scenario would be as described above. For the reasons stated above with regard to full implementation of the LRDP, this impact would be less than significant.

Impact HAZ-2: Future construction activities, including earth-moving activities such as excavation and grading, could expose construction workers or the environment to hazardous materials. (Less than Significant)

Excavation, grading, and dewatering associated with future construction activities could encounter soil or groundwater that has been affected by hazardous materials use at LBNL. For example, future construction activities could require the removal of USTs or ASTs, which would occur in compliance with state tank regulations. Soil and/or groundwater sampling performed at the time of tank removal could reveal previously unknown petroleum hydrocarbon impacts. Building demolition activities could also allow testing and/or remediation of suspected or known soil contamination in areas that were previously inaccessible.

LBNL has performed site investigations for soil and groundwater contamination in accordance with requirements of the RCRA Corrective Action Program. Human health and ecological risk assessments performed under the program have identified areas of potential hazards. As depicted on Figure IV.F-1, p. IV.F-6, groundwater contamination has been detected at a number of locations, and corrective action measures have been implemented to address the contamination. Construction activities at some locations, including former USTs for which LBNL has received case closure, have the potential to encounter soil that contains residual petroleum hydrocarbon contamination.[17] Improper handling or disposal of contaminated soil or groundwater associated with future laboratory and facility expansion could expose construction workers, the public, and the environment to hazardous conditions.

The most recently published (2001) California Hazardous Waste and Substances List, compiled in accordance with Government Code Section 65962.5 and more commonly known as the Cortese List, included six locations within LBNL: Buildings 7E, 50, 62, 69, 74, and 76. These sites were included due to the presence of leaking USTs. LBNL has received case closure from the City of Berkeley and San Francisco Bay RWQCB for these former USTs.

Construction activities at LBNL would continue to comply with applicable laws and regulations that govern the exposure of workers, the public, and the environment to hazardous materials, as well as LBNL-specific policies. Potential exposure of workers, the public, and the environment to hazardous materials would be minimized through development of Construction Site Health and Safety Plans and proper handling, storage, and disposal of contaminated soil and groundwater. This would reduce impacts to less-than-significant levels.

Mitigation: None required.

Project Variant. The project variant would increase the average daily population on the Berkeley Lab hill site but would not change the projected building square footage. While some buildings could be used in different ways than might be the case under the project as proposed, the variant would not result in appreciably different effects with regard to building construction.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for evaluating the potential exposure to workers or the environment of hazardous materials in connection with future construction activities. Effects due to construction of specific potential structures under the LRDP such as those denoted in the Illustrative Development Scenario would be as described above. For the reasons stated above with regard to the LRDP, this impact would be less than significant.

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[17] Regulatory case closure for leaking USTs (or other hazardous material sources) can be received even though contaminated soil and/or groundwater remains on-site. The potential for petroleum hydrocarbon impacts to remain at former UST locations, including areas that have received regulatory closure, would therefore be ascertained during detailed environmental review of specific development projects on or adjacent to former UST locations.

IV.F.3.5 Operations Impacts

Impact HAZ-3: Operation of LBNL pursuant to the 2006 LRDP, including proposed increases in laboratory and facility space, would increase the use of hazardous materials in research, facility construction, and facility maintenance activities, consequently resulting in increased generation, storage, transportation, and disposal of hazardous wastes, including transport associated with off-site disposal of hazardous and radioactive wastes, from research and facility maintenance activities. (Significant; Less than Significant with Mitigation)

Expansion of laboratory space under the 2006 LRDP would increase the quantity of hazardous and radioactive materials stored at LBNL. Table IV.F-5 summarizes the estimated quantities of hazardous and radioactive materials stored at LBNL in 2025, compared with quantities stored in 2003. These quantities do not include temporary storage and use of hazardous materials associated with construction of proposed facilities. These estimates are conservatively based on full build-out of laboratories and other facilities as depicted in the Illustrative Development Scenario.

Hazardous materials use and other activities at LBNL result in the generation of hazardous, low-level radioactive, mixed, and medical wastes. Implementation of the LRDP would result in the expansion of laboratory facilities that use these materials; therefore, waste generation on the site is expected to increase. Table IV.F-6 summarizes waste quantities produced by LBNL during 2003 and projected operations in 2025.

As summarized in Table IV.F-5, future expansion of LBNL facilities and laboratory space is expected to result in a 45-percent increase in hazardous materials storage and a 38-percent increase in radioactive materials storage by 2025. Storage of these materials would continue to be regulated by applicable federal, state and local requirements, as well as LBNL's policies and plans.

TABLE IV.F-5
QUANTITIES OF HAZARDOUS MATERIALS STORED AT LBNL

Classification	Quantity Stored (2003)	Projected Quantity Stored (2025)[1]
Hazardous Materials		
Gas	103,116 cubic feet	149,518 cubic feet (45% increase)
Liquid	40,604 gallons	58,876 (45% increase)
Solid	27,895 pounds	40,488 pounds (45% increase)
Radioactive Materials		
Sealed	681 Curies[2]	940 Curies (38% increase)
Unsealed	8 Curies	11 Curies (38% increase)

1 Projected quantities conservatively based on full build-out of laboratories and other facilities as depicted in the Illustrative Development Scenario.
2 See footnote 1, page IV.F-1.

SOURCE: LBNL, 2004a.

TABLE IV.F-6
QUANTITY OF HAZARDOUS WASTE GENERATED AT LBNL

Classification	Quantity Generated (2003)	Projected Quantity Stored (2025)[1]
Hazardous Waste	61,335 pounds	88,777 pounds (45% increase)
Low-Level Radioactive Waste	4,273 pounds (1,230 Curies[2])	5,888 pounds (38% increase) (1,697 Curies [<38% increase])
Mixed Waste	492 pounds (585 Curies)	534 pounds (9% increase) (638 Curies [<9% increase])
Medical Waste	33,922 pounds	49,187 pounds (45% increase)

1 Projected quantities conservatively based on full build-out of laboratories and other facilities as depicted in the Illustrative Development Scenario.
2 See footnote 1, page IV.F-1.

SOURCE: LBNL, 2004a.

As shown in Table IV.F-6, the quantity of hazardous waste, low-level radioactive waste, mixed waste, and medical waste generated at LBNL is also expected to increase, particularly as laboratory space and functions increase. Future generation, handling, storage, and transport of these types of wastes would continue to be subject to applicable federal, state, and local requirements. For example, LBNL is required by DOE to minimize hazardous waste production, and to detail waste minimization efforts in annual reports. Also, future operation of LBNL's HWHF would continue to be subject to applicable DTSC and DOE regulations and reporting requirements. For a detailed accounting of Berkeley Lab's environmental performance in regard to the handling, storage, and transport of hazardous waste and low-level radioactive waste, please refer to Berkeley Lab's Annual Site Environmental Report (and related reports) at: http://www.lbl.gov/ehs/esg/tableforreports/tableforreports.htm. In addition, LBNL regularly reports to the City of Berkeley on the types and quantities of such materials stored and used at the Lab in its annual Hazardous Materials Business Plan.

LBNL currently complies with measures identified in the 1987 LRDP EIR, as amended, to ensure that hazardous materials and wastes are stored, used, and generated at the site in a manner that minimizes potential exposure of individuals and the environment to hazardous conditions. These would be continued under the new LRDP. Continued compliance with these measures, and with applicable laws, regulations, and policies, would reduce impacts to less-than-significant levels.

The following 2006 LRDP EIR mitigation measures are taken from the 1987 LRDP EIR, as amended, with slight modifications:

> **Mitigation Measure HAZ-3a:** LBNL shall continue to prepare an annual self-assessment summary report and a Site Environmental Report that summarize environment, health, and safety program performance and identify any areas where LBNL is not in compliance with environmental laws and regulations governing hazardous materials, and worker safety, emergency response, and environmental protection.

An EH&S assessment of LBNL activities is performed annually, and these results are reported annually in the LBNL Self-Assessment Report. In addition, LBNL prepares an annual Site Environmental Report that describes the environmental activities noted above. Implementation of this measure would ensure that the information in the LBNL Self-Assessment and Site Environmental Reports continues to be collected, reviewed, and provided.

Mitigation Measure HAZ-3b: Prior to shipping hazardous materials to a hazardous waste treatment, storage, or disposal facility, LBNL shall confirm that the facility is licensed to receive the type of waste LBNL is proposing to ship.

LBNL is required by DOE Order 435.1 to verify that the receiving facility has all appropriate licenses and that the waste meets all waste acceptance criteria of the receiving facility.

Mitigation Measure HAZ-3c: LBNL shall require hazardous waste haulers to provide evidence that they are appropriately licensed to transport the type of wastes being shipped from LBNL.

Shipping procedures at LBNL require all transporters of hazardous, radioactive, and mixed waste to provide evidence that they are appropriately licensed.

Mitigation Measure HAZ-3d: LBNL shall continue its waste minimization programs and strive to identify new and innovative methods to minimize hazardous waste generated by LBNL activities.

Each LBNL Division is required to identify and implement new waste minimization activities each year. The waste minimization program at LBNL reduced hazardous waste by 72% during the period 1993-2004.

Mitigation Measure HAZ-3e: In addition to implementing the numerous employee communication and training requirements included in regulatory programs, LBNL shall undertake the following additional measures as ongoing reminders to workers of health and safety requirements:

- Continue to post phone numbers of LBNL EH&S subject matter experts on the EH&S website.[18]
- Continue to post Emergency Response and Evacuation Plans in all LBNL buildings.
- Continue to post sinks, in areas where hazardous materials are handled, with signs reminding users that hazardous materials and wastes cannot be poured down the drain.
- Continue to post dumpsters and central trash collection areas where hazardous materials are handled with signs reminding users that hazardous wastes cannot be disposed of as trash.

[18] This mitigation measure has been slightly altered from the previous wording of “Post, in areas where hazardous materials are handled, phone numbers of LBNL offices that can assist in proper handling and emergency response information.”

> **Mitigation Measure HAZ-3f:** LBNL shall update its emergency preparedness and response program on an annual basis and shall provide copies of this program to local emergency response agencies and to members of the public upon request.

Compliance with the measures identified above and with federal, state, and local rules and regulations would reduce potential impacts associated with increased quantities of hazardous and radioactive materials used, and the subsequent waste generated, stored, and transported to a less-than-significant level.

> **Significance after Mitigation:** Less than significant.

Project Variant. The project variant would increase the average daily population on the Berkeley Lab hill site but would not change the projected building square footage. Under the variant, some buildings could be used in different ways than might be the case under the project as proposed. However, under the variant, most of the off-site staff who would move to the Lab's main hill site would be administrative staff, and therefore changes in building usage would likely take the form of, for example, office space being used more intensively. Because the variant would result in no substantial change in the number of technical staff on the hill site, no measurable change in the nature or volume of hazardous or radioactive materials used or related waste generated would be expected. Thus, the variant would not result in appreciably different effects from the project as proposed.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of hazardous material and hazardous waste impacts. Potential individual projects under the 2006 LRDP such as those denoted in the Illustrative Development Scenario would result in the same activities and uses on the Lab hill site as described above, and therefore their effects would be the same as those of the LRDP as a whole. For the reasons stated above with regard to full implementation of the LRDP, this impact would be less than significant with implementation of Mitigation Measures HAZ-3a through HAZ-3f.

Impact HAZ-4: Implementation of the LRDP would involve the handling of hazardous materials and wastes within one-quarter mile of an existing school. (Significant; Less than Significant with Mitigation)

There are no public or private elementary, middle, or high schools within one-quarter mile of LBNL, although there are several day-care/child-care centers and preschools. Portions of the

UC Berkeley campus are also within one-quarter mile of Berkeley Lab. Compliance with federal, state, and local rules and regulations, and Mitigation Measures HAZ-3a through HAZ-3f, would reduce potential impacts to nearby schools associated with the handling of hazardous materials and wastes to a less-than-significant level.

Effects related to emissions of toxic air contaminants and radionuclides from LBNL laboratories and other emissions sources at Berkeley Lab are assessed separately in Section IV.B, Air Quality, of this document.

Mitigation: See Mitigation Measures HAZ-3a through HAZ-3f, above.

Significance after Mitigation: Less than significant.

Project Variant. As described under Impact HAZ-3, the project variant would result in no substantial change in the number of technical staff on the hill site and no measurable change in the nature or volume of hazardous materials used or hazardous waste generated. Thus, the variant would not result in appreciably different effects from the project as proposed, and would be less than significant with implementation of Mitigation Measures HAZ-3a through HAZ-3f.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to schools associated with the handling of hazardous materials and wastes. Development of the facilities that are conceptually portrayed in the Illustrative Development Scenario would not substantially alter the proximity of LBNL uses that handle hazardous materials and wastes to local schools. Therefore, for the reasons stated above with regard to the LRDP, this impact would be less than significant with implementation of Mitigation Measures HAZ-3a through HAZ-3f.

Impact HAZ-5: Implementation of the LRDP could increase exposure of people or structures to hazards that could result from regional, compounded, or terrorist-related catastrophic events. (Less than Significant)

Full development under the LRDP would increase the number of people and the amount of property that could be exposed to regional, compounded, or terrorist-related catastrophic events. Regionally catastrophic events could include earthquakes or fires of sufficient magnitude to impair regional emergency support and service systems such that LBNL could not expect to receive aid from external sources. Compounded catastrophic events could include a confluence of calamitous events, such as a large earthquake followed by a subsequent major wildland fire, that could put additional strains on the ability of LBNL, local, and regional services to address them. Catastrophic terrorist events could include direct acts of terror at the LBNL main site, such as bombings or releases of hazardous materials, or in the region. All of these conditions are referred to throughout this section as "catastrophic events." Any of these catastrophic events could warrant consideration of whether to evacuate the Berkeley Lab main site, if possible.

Impacts resulting from such catastrophic events may be different from or more severe than those that could result from single events (earthquake, fire, etc.) that are described and analyzed in other sections of this EIR. This section considers the relative likelihood of such catastrophic events occurring at the LBNL site, as well as the potential direct impacts and secondary impacts (e.g., from evacuation) of such catastrophic events. It further identifies how these factors could be influenced by implementation of the 2006 LRDP program.

Likelihood of Occurrence

Earthquake and Fire

Under the 2006 LRDP, additional Berkeley Lab population and space could be subject to potential compounded earthquake and fire events. However, the likelihood of these compounded events occurring is relatively low, and this would not be substantially altered by the proposed project. In fact, in some ways, this likelihood may be decreased due to new construction standards and best management practices.

As described in Section IV.E of this EIR, LBNL's proximity to the Hayward fault, Alquist-Priolo seismic hazard zone, and other area faults puts it in a region that may experience a major seismic event during the 2006 LRDP planning period (e.g., probability of a magnitude 6.7 or greater earthquake along the 60+ mile Hayward fault by 2032 is estimated at 27 percent; for all regional faults, probability is 62 percent by 2032). The last major earthquake on the Hayward Fault Zone occurred in 1868.

As described in Section IV.F of this EIR, the LBNL main site is also located at an interface of development and vegetated wildlands in the lower East Bay hills. This area can be subject to wildland fires, particular for brief periods of the fall when "Diablo" wind conditions occur. Such fires have been noted to occur in the nearby East Bay hills at approximately ten-year intervals; the last major wildland fire in this area occurred in 1991.

The probability that, during the 20-year planning period, a major earthquake would occur during a fall month on a rare "Diablo" wind condition day is considerably lower than the probability of either of these events occurring individually. Nevertheless, under the 2006 LRDP, Berkeley Lab would undertake or continue to undertake the following preventative measures:

- LBNL's ongoing vegetation management program would continue to maintain the surrounding vegetative fuel supply so as to provide protection from worst case Diablo wind-driven wildland fires.

- Construction under the 2006 LRDP would continue to comply with requirements of the latest California Building Code, University of California seismic design safety policies, federal standards, and LBNL's lateral force design criteria.

- All new structures built on the LBNL main site would include installation of automatic fire-sprinkler systems.

- LBNL's main gas lines would be protected by automatic shut-off valves. With loss of system continuity or pressure occurring from a breach, this system would shut off and prevent an uncontrolled release of natural gas.

- Many older buildings built to less stringent standards would be replaced under the 2006 LRDP. This would remove people and property from structures that are potentially less able to withstand seismic events.

- LBNL would continue to support its Environment, Health & Safety Division, which is staffed with health and safety experts who monitor and oversee safety aspects of the Lab and its operations. It would also continue to maintain Facilities Division inspectors and preventative maintenance crews to keep the Lab's facilities and safety systems in working order.

- Subsequent development projects resulting from implementation of the proposed LRDP would occur within the Lab boundary and generally would not extend into the adjacent wildland areas, meaning that the project would not be anticipated to increase the number or intensity of potential wildfires.

Terrorist Event

Under the 2006 LRDP, additional Berkeley Lab population and space could be subject to potential acts of terrorism. However, the likelihood of terrorist events occurring is expected to be very low, and this would not be substantially altered by the proposed project.

LBNL is a National Laboratory, a federal and state asset, and it is associated with the advancement of science and technology in the United States. It is also, at times, a subject of controversy due to the nature of its scientific work and mission. Accordingly, LBNL could be a potential target of interest to terrorist or other extremist groups. However, the likelihood for terrorist actions occurring at Berkeley Lab is expected to be very low under the proposed planning period.

Terrorist actions in the U.S. are relatively rare, and there has never been a major terrorist act or attempt at Berkeley Lab. LBNL is not a facility with a high public profile in comparison to some more widely known National Laboratories. With the exception of the distinctive Advanced Light Source dome, LBNL's presence in the East Bay hills is not highly visible to the greater outside community. Furthermore, Berkeley Lab does not conduct classified research. The Laboratory is spread over a fairly dispersed area among its 202 acres, and thus it does not present a concentrated target of population and facilities for a bombing or toxic release. Nevertheless, under the 2006 LRDP, Berkeley Lab would undertake or continue to undertake the following preventative measures to further decrease the likelihood of a terrorist event at LBNL:

- LBNL would continue to maintain its secure perimeter fence line and controlled access gates. All persons entering the Lab will have to present identification and permission for entering the main site or its off-site leased space.
- LBNL would continue to operate its 24-hour-per-day, seven-day-per-week on-site security services, as well as its contract with UC Berkeley police services.
- LBNL would continue to be supported by the FBI, DOE Counterintelligence Office, DOE Security Office, and DOE IG Office.
- LBNL would continue to benefit from the State of California's Law Enforcement Mutual Aid Agreement with response from local and state law enforcement agencies when necessary.
- Development under the 2006 LRDP would follow along the pattern of dispersed clusters, thus not concentrating the majority of the Lab's population or property in a close area.
- The 2006 LRDP would not redirect Berkeley Lab's research mission toward a classified or weapons-related area.

Under the proposed 2006 LRDP, the likelihood of potential catastrophic events occurring to the incrementally increased population and facilities of LBNL would not be significant or substantially more severe than under existing conditions.

Direct Impacts

Earthquake and Fire

As discussed elsewhere in this section and in Sections IV.E, Geology and Soils, and IV.K, Public Services and Recreation, impacts associated with earthquakes or fires at LBNL under the proposed project are, individually, less than significant. Under compounded events such as major earthquakes and associated fires, such effects could be different from or more severe than might be the case with single earthquake or fire events.

The immediate effects of a catastrophic event on the LBNL main site could include injury to on-site personnel and damage to on-site property. Under earthquake conditions, risk of structural failure, falling objects, and landslides could result. Possible rupture of gas lines or downing of electrical power lines could increase the chance of post-earthquake fire or injury, and leave LBNL without external sources of power. Conventional communication lines could be cut off. Water lines may be damaged, interrupting water service or pressure, thus limiting the ability of LBNL to fight subsequent fires. Under widespread fire conditions, risk of damage and injury due to heat and smoke could result. A catastrophic earthquake and fire event could potentially damage or constrict access roads and/or tie up local and regional emergency service providers such that their assistance would not be available. Moreover, under regionally catastrophic conditions, such emergency service providers could be overextended and not available to assist LBNL.

Under the proposed project, additional staff and facilities would be subject to potential impacts from major catastrophic events, as those identified above. However, newer buildings under the program would be constructed to the latest building and safety codes, and these would replace several older, outdated buildings. Current safety measures and procedures would continue under the 2006 LRDP program. As described elsewhere in this EIR, LBNL has taken many precautions to limit the impacts of such events should they occur. These measures would include the following:

- LBNL would continue to provide for an on-site Alameda County fire station, which provides fire and emergency medical response.
- LBNL would continue to maintain its own medical clinic, which is staffed by doctors and other trained medical personnel during business hours.
- Construction under the 2006 LRDP would comply with requirements of the latest California Building Code, University of California seismic design safety policies, federal standards, and LBNL's lateral force design criteria. Such construction would help to minimize the potential injuries, damage, and subsequent fire that could result from a seismic event.
- LBNL would continue to maintain and update its Master Emergency Program Plan (MEPP), which establishes policies, procedures, and an organizational structure for responding to and recovering from a major disaster at LBNL.
- LBNL would continue to maintain its three 200,000-gallon emergency water tanks, which are spaced strategically throughout its site. These are designed to maintain pressure and supply of emergency water even in the event of loss of water supply from external sources.

Terrorist Event

Acts of terrorism or extremist groups at LBNL could include bombings, arson, release of toxic materials or biological agents, personal acts of violence, or sabotage of mechanical or computing systems. Such potential events, however unlikely to occur, are the subject of careful prevention and response planning undertaken by LBNL, the University, and the Department of Energy.

Berkeley Lab is a secure facility. Its distinctive geography, which disperses its population throughout winding canyons and plateaus throughout an almost two-mile stretch of the East Bay hills, would prevent a large concentration of the Lab's population from being exposed directly to a single conventional bombing event. Similarly, dispersed wind patterns would render a toxic or biological release less effective at LBNL than at a concentrated urban location where a maximum number of people could be exposed within a minimal or confined area. Nevertheless, should such events occur at LBNL, the following measures would be undertaken, or would continue to be undertaken, under the LRDP program to minimize the effects of a terrorist or extremist group action:

- LBNL would continue to maintain its 24-hour, seven-day-per-week on-site security force and its police services contract with UC Berkeley Police Department.
- LBNL would continue to maintain through contract with Alameda County its 24-hour, seven-day-per-week on-site fire station with emergency medical response capabilities.
- Hazardous materials emergency response (HAZMAT) services would continue to be provided by LBNL's on-site Alameda County fire station, which maintains an "around-the-clock" engine company staffed by four HAZMAT (Hazardous Materials Emergency

Response)-certified firefighters. HAZMAT automatic aid is offered through the Berkeley Fire Department, when available, and the Alameda County Fire Department. Depending on the magnitude of an incident, additional HAZMAT response support is available through the formal Fire Mutual Aid Plan, which the Alameda County Fire Department coordinates. Additionally, the Lab has an "around-the-clock" contract with a private vendor for HAZMAT clean-up.

- LBNL would continue to maintain its on-site medical clinic, which is staffed with medical doctors and nursing staff during Lab business hours.
- The Lab would continue to enhance its participation in the National Incident Management System (NIMS), as prescribed by Homeland Security Presidential Directive-5 – Management of Domestic Incidents. NIMS is a nationwide, standardized approach to incident management and response that establishes a single, comprehensive system for incident management and cooperation among departments and agencies at all levels of government, from federal to local. For more information, please refer to Section IV.K, Public Services and Recreation).
- All procedural, equipment, and supply safety procedures, including locking and securing of sensitive systems and of potentially dangerous equipment and chemicals, would continue to be undertaken under the 2006 LRDP and overseen by LBNL's Environment, Health, & Safety division.
- LBNL would continue its aggressive programs to maintain, update, and improve its computer and "cyber-security" systems.

Under the proposed 2006 LRDP, the impacts associated with potential catastrophic events to the incrementally increased population and facilities of LBNL would not be significant or substantially more severe than under existing conditions.

Evacuation Impacts

A catastrophic event occurring during business hours at LBNL could trigger a decision whether or not to evacuate the LBNL site. Evacuation decisions and procedures would reside with LBNL's Executive Team under its Emergency Operations Center (EOC). A decision on whether to evacuation under catastrophic conditions could result in three principal outcomes: evacuation by vehicle, evacuation by foot, or "shelter in place." In any of these three scenarios, LBNL also may order evacuation of specific buildings or areas of the Lab deemed unsafe.

Evacuation by Vehicle

Evacuation by vehicle would involve moving personnel off the LBNL main site via personal vehicles and/or, if appropriate, by Lab shuttle buses and government vehicles. Evacuees would be directed to leave through gates as identified by LBNL security and traffic control forces.

Under a catastrophic earthquake scenario, many roadways in the region could be rendered unusable for reasons including earthquake damage, landslides, loss of more remote area roads and bridges, heightened congestion from other evacuating motorists, and increased emergency vehicle use on the roadways. Under catastrophic conditions, vehicles leaving from LBNL's exits in an uncontrolled or uninformed manner could unintentionally travel toward the path of an on-coming fire.

An uncontrolled LBNL evacuation by vehicle could add to congestion and hamper evacuation or emergency vehicle access to that area. For example, the Panoramic Hill neighborhood, which is a Berkeley neighborhood inhabiting the slopes south of LBNL across Strawberry Canyon, has only one egress/access road – Panoramic Way. Panoramic Way feeds into Stadium Rim Way and Prospect Street in a relatively constricted intersection configuration. If the Panoramic Hill neighborhood were evacuating by vehicle, egress constriction at that intersection could be exacerbated if additional cars evacuating from LBNL through its Grizzly and Strawberry Canyon gates were to then travel southward on Centennial Drive to Stadium Rim Road.

Under the 2006 LRDP, EOC measures would not allow uncontrolled vehicle evacuation of the site if conditions did not warrant this. During or after a catastrophic event, the Lab's perimeter gates would be controlled. For example, gates may be closed to all vehicles except for emergency services, as warranted by the EOC. Any decision to evacuate would be coordinated through EOC command, including with the UC Berkeley Police Department, City of Berkeley Police Department, Alameda County Sheriff's Department, and the California Highway Patrol to ensure an informed and coordinated response.[19] Uncontrolled evacuation by vehicle, particularly during a wildland fire and on roads that would affect constricted areas such as the Panoramic Hills neighborhood, would not be permitted.

Evacuation by Foot

An evacuation by foot order would direct LBNL staff to leave the site, walking by way of the Lab's roadways and walkways, to an assembling point in UC Berkeley's intramural sports grass field in Strawberry Canyon, approximately 600 feet south of the Lab's fence line, or any other area designated by the University. Those requiring special assistance would be provided with other means of transport.

Shelter in Place

A shelter in place order would have LBNL staff remain on-site for an indeterminate period of time. This is viable because the Lab can be self-sustaining in emergencies, with its own internal, temporary supplies of food, water, shelter, heating and warmth, emergency power, medical supplies and medical professionals, and communications, along with its own on-site fire station and security forces.

In most scenarios, where a catastrophic event has occurred, shelter in place would be the preferred option to evacuation.

Mitigation: None required.

[19] Communication with regional EOC command, the City of Berkeley, and outside emergency providers, among others, would be maintained by the LBNL's on-site microwave relaying, digital communication system. This system employs the Lab's 140-foot-tall microwave tower and can be powered by back-up generators in emergencies. The system patches LBNL to the Alameda County Regional Emergency Communications Dispatch Center located at the Lawrence Livermore National Laboratory.

Project Variant. The project variant would increase the average daily population (ADP) at the hill site by 350 people, an increase of 30 percent over the projected ADP increase under the project as proposed. The additional staff would be consolidated from off-site locations and accommodated within the 2.42 million gross square feet of building space on the hill site proposed under the 2006 LRDP.

The increase in on-site population that would result from implementation of the project variant would increase the number of people that could be subject to the impacts from a potentially occurring catastrophic event, including a potential terrorist act. There also might be increased demand for on-site security, emergency responders, and others associated with preventing or responding to catastrophic events.

This incremental increase in population that could be exposed to potential but rare catastrophic events and any slight increase in demand for police, fire, and emergency medical services are not anticipated to result in the need for new facilities, staff, or equipment. The preventative measures described above would apply to the project variant. Therefore the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is conceptually portrayed in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to public services and recreation. Potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would not result in substantial new risks due to potentially occurring catastrophic events and therefore the impact of such projects on Berkeley Lab hazards would be less than significant for the reasons noted above.

Impact HAZ-6: Implementation of the LRDP would expose people or structures to wildland fire hazards. (Less than Significant)

Full development under the LRDP would increase both laboratory and other facility space at the LBNL hill site. Although this development would meet required safety standards and fire codes at the time of individual facility construction, wildland fire hazards would continue to threaten the LBNL site. However, continued implementation of LBNL’s vegetation management program would limit damage to assets from these fires and would reduce potential wildland fire hazards to a less-than-significant level.

As described in Chapter III, Project Description, the great majority of new construction and renovation occurring under the LRDP would be located within the area designated as developable area, which includes approximately 72 percent of the 202-acre Lab site. The Perimeter Open Space land use zone, shown in Figure III-3, LRDP Land Use Map, in Chapter III, Project Description, would continue to be managed to reduce wildland fire risks, where future development would be primarily reserved for minor maintenance, support structures, or paths and where the open, wooded, or grassland character of the hillside site would be retained to the extent feasible.

Mitigation: None required.

Project Variant. While the project variant would result in an increase in average daily population on the Lab's main hill site compared to the project as proposed, the Lab's continued vegetation management program would be anticipated to reduce wildland fire hazard risks to a less-than-significant level, as described above. Therefore, no substantial increase in the severity of the wildland fire risk is anticipated.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of wildfire hazard impacts. Development of the facilities conceptually portrayed in the Illustrative Development Scenario would affect only the placement of specific facilities on the Lab's hill site and would not alter the Lab's approach to vegetation management. Therefore, effects of projects under the LRDP such as denoted in the Illustrative Development Scenario would be the same as those resulting from the LRDP. For the reasons stated above with regard to full implementation of the LRDP, this impact would be less than significant.

IV.F.3.6 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. Additional projects currently under way at UC Berkeley, described in Section VI.C of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis is generally limited to the LBNL hill site and the UC Berkeley campus, as these are the locations where hazardous materials use would be expected to increase and to reasonably be expected to result in some cumulative effect, were any to occur. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.F-21) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to a level of significance.

Impact HAZ-7: Implementation of the LRDP would contribute to cumulative increases in exposure to hazards and hazardous materials. (Less than Significant)

As discussed above, implementation of the LRDP would increase storage of hazardous and radioactive materials at LBNL and increase the generation of hazardous, low-level radioactive, mixed, and medical waste. Additionally, implementation of the LRDP could result in development that disturbs contaminated soil or groundwater, or increase exposure to wildland fire hazards. In the vicinity of LBNL, UC Berkeley would increase the amount of hazardous materials handled and hazardous waste requiring disposal through implementation of its own LRDP update.[20] Other changes that could further increase the amount of hazardous materials and waste handled in the area include expansion of biotechnology industry firms in the East Bay and expansion of or changes in the operations of refineries, chemical companies, and other hazardous materials and waste facilities in western Contra Costa County.

Compliance by LBNL with federal, state, and local regulations, LBNL policies, and the mitigation measures listed above would reduce potential impacts. Similar compliance with regulations governing hazardous materials and hazardous wastes by UC Berkeley and other institutions would reduce potential cumulative impacts in the vicinity of LBNL to less-than-significant levels. Therefore, implementation of the LRDP would not result in a considerable contribution to any cumulative increases in the use of or exposure to hazards or hazardous materials.

Mitigation: None required.

Project Variant. While the project variant would result in an increase in average daily population on the Lab's main hill site and therefore an increased exposure to hazards and hazardous materials, the impact would be similar to that of the project as proposed. Accordingly, the project variant would not result in a considerable contribution to any cumulative increases in the use of or exposure to hazards or hazardous materials. Therefore, this impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense

[20] The EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) found that those projects would not result in any adverse impacts related to hazards or hazardous materials, and thus the SCIP would not contribute to any cumulative impacts (UC Berkeley, 2006).

than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of cumulative impacts related to hazardous materials use. Development of a project under the LRDP such as identified in the Illustrative Development Scenario would result in increased exposure to hazards and hazardous materials; however, such a project would not result in a considerable contribution to any cumulative increases in the use of or exposure to hazards or hazardous materials for the reasons stated above for the LRDP. Therefore, this impact would be less than significant.

In terms of cumulative impacts related to catastrophic events, the analysis under Impact HAZ-5, above, describes effects that could occur subsequent to a regional catastrophe, such as an earthquake or wildfire (or a combination of the two) and terrorist events, and concludes that the impact would be less than significant. Based on this analysis, it is reasonable to conclude that LBNL's contribution to any region-wide impacts would be less than considerable, in the context of CEQA cumulative impacts, because implementation of the 2006 LRDP would not substantially increase the Lab's contribution to any such risk and would, in some instances, decrease the Lab's contribution, compared to existing conditions (such as through construction of newer, more seismically secure facilities). Therefore, the cumulative impact would be less than significant.

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IV.G. Hydrology and Water Quality

IV.G.1 Introduction

This section discusses existing surface water and groundwater conditions at LBNL and analyzes the potential for the project to alter drainage patterns, increase stormwater runoff rates, adversely affect ground or surface water quality, or decrease groundwater recharge rates to an extent that the groundwater table is lowered. These factors were analyzed based on existing conditions within the Strawberry Creek Watershed and at the site, the extent and nature of proposed development, and future operation of the proposed facilities.

IV.G.2 Setting

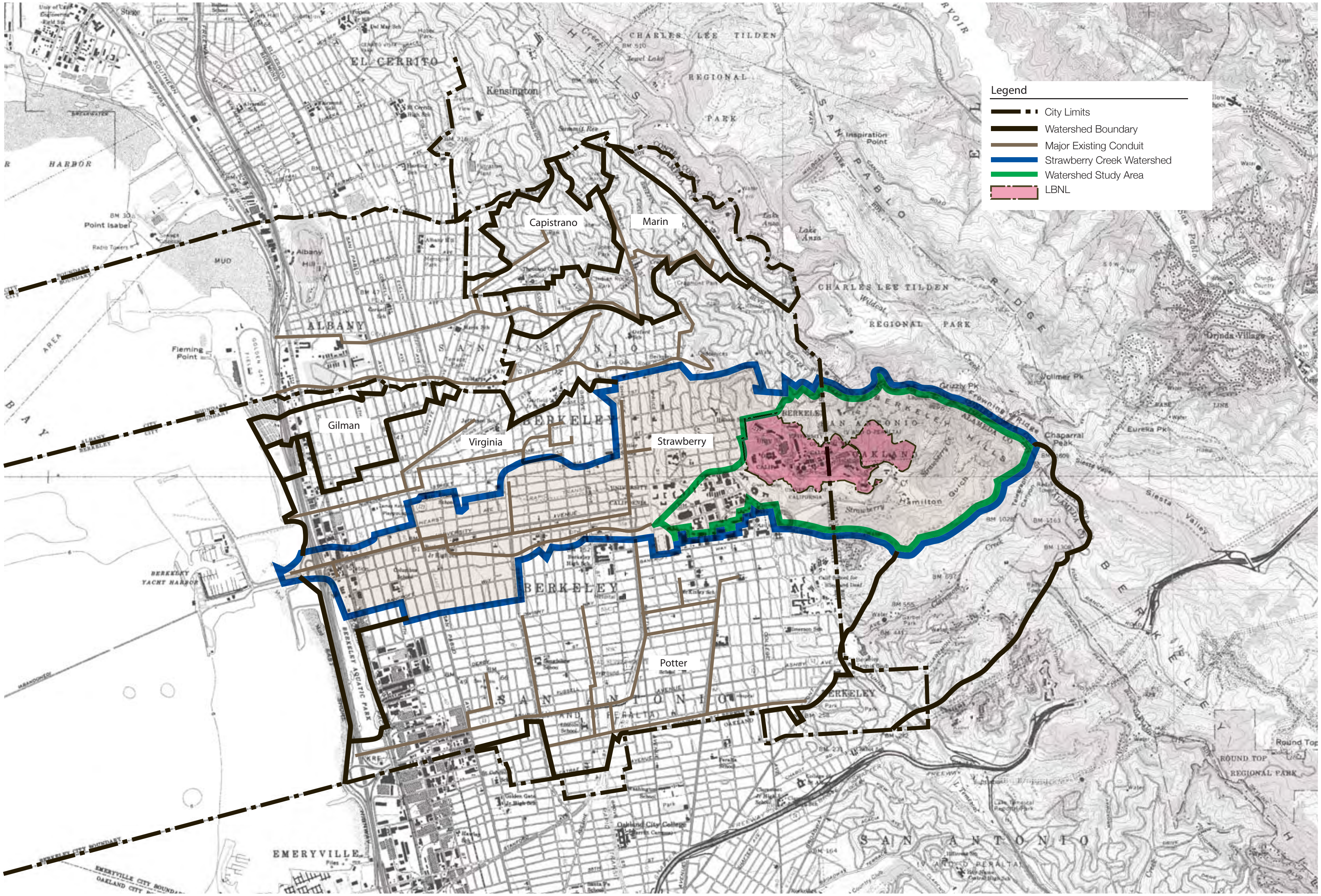
IV.G.2.1 Hydrologic Setting

Surface Water

LBNL is situated within Blackberry and Strawberry Canyons in the East Bay hills, with the vast majority of the site lying within the Strawberry Creek Watershed, as shown in Figure IV.G-1. This watershed has been modified since Native American times, when the area was regularly burned. It was subsequently grazed by animals of Spanish and Mexican settlers, and later farmed and used for dairy production by the Anglo settlers who followed. Beginning in the mid-19th century, the watershed was exploited as a water supply source in order to allow the growth of what has become the City of Berkeley. Thus historical development has resulted in alteration to hydrologic flow patterns and rates within the watershed (UC Berkeley, 1987).

The entire Strawberry Creek Watershed, from the East Bay hills to the San Francisco Bay, is approximately 2,066 acres in size. Berkeley Lab occupies 202 acres or about 10 percent of the total watershed. Traversing from east to west, there are four distinct levels of physical development evident: minimal development (hill area), light development (LBNL area), medium development (UC Berkeley campus), and heavy development (City of Berkeley).

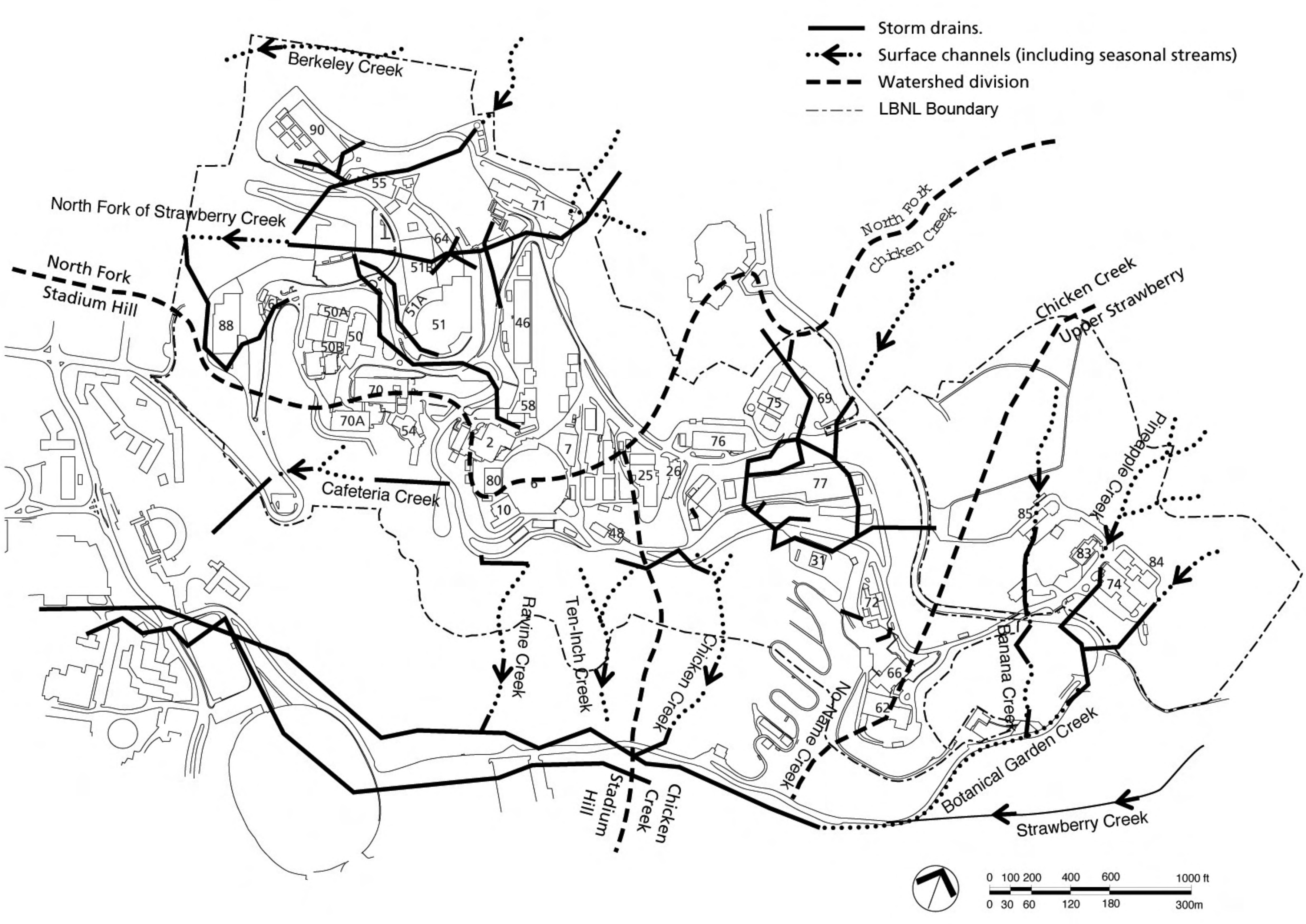
As depicted in Figure IV.G-2, the northwest portion of the LBNL site drains to the North Fork of Strawberry Creek, while the majority of LBNL drains to the South Fork of Strawberry Creek. Most of the contributing drainages are not formally named, but are commonly referred to by local residents and in LBNL publications with names that are used in this document for purposes of identification. The total watershed area of the Strawberry Creek North and South Forks pertinent to LBNL is 878 acres. Of this area, LBNL occupies and manages 202 acres, with the remaining 675 acres managed by UC, City of Berkeley, or City of Oakland. The extreme northwest corner of the Laboratory, approximately 2 acres, lies within the Lincoln/Schoolhouse Creek Watershed; however, this flow was diverted by the City of Berkeley and now also discharges into the North Fork of Strawberry Creek.



SOURCE: Lawrence Berkeley National Laboratory (2006)

LBNL 2006 Long Range Development Plan . 201074

Figure IV.G-1
Strawberry Creek Watershed



SOURCE: Lawrence Berkeley National Laboratory (2003)

Figure IV.G-2
Stormwater Drainage

In addition to the 202 acres of Lab runoff, LBNL must also manage “run-on” flow from 186 acres uphill and east of the Lab as shown on Figure IV.G-3. These acres are primarily undeveloped University-owned research and ecological study area land, University-owned institutional development, such as the Lawrence Hall of Science, and some Berkeley residential area. This water enters the LBNL storm drain system at six distinct locations. Because of the very steep terrain and areas involved, energy dissipators and other controls have been installed to mitigate peak flows onto the LBNL site.

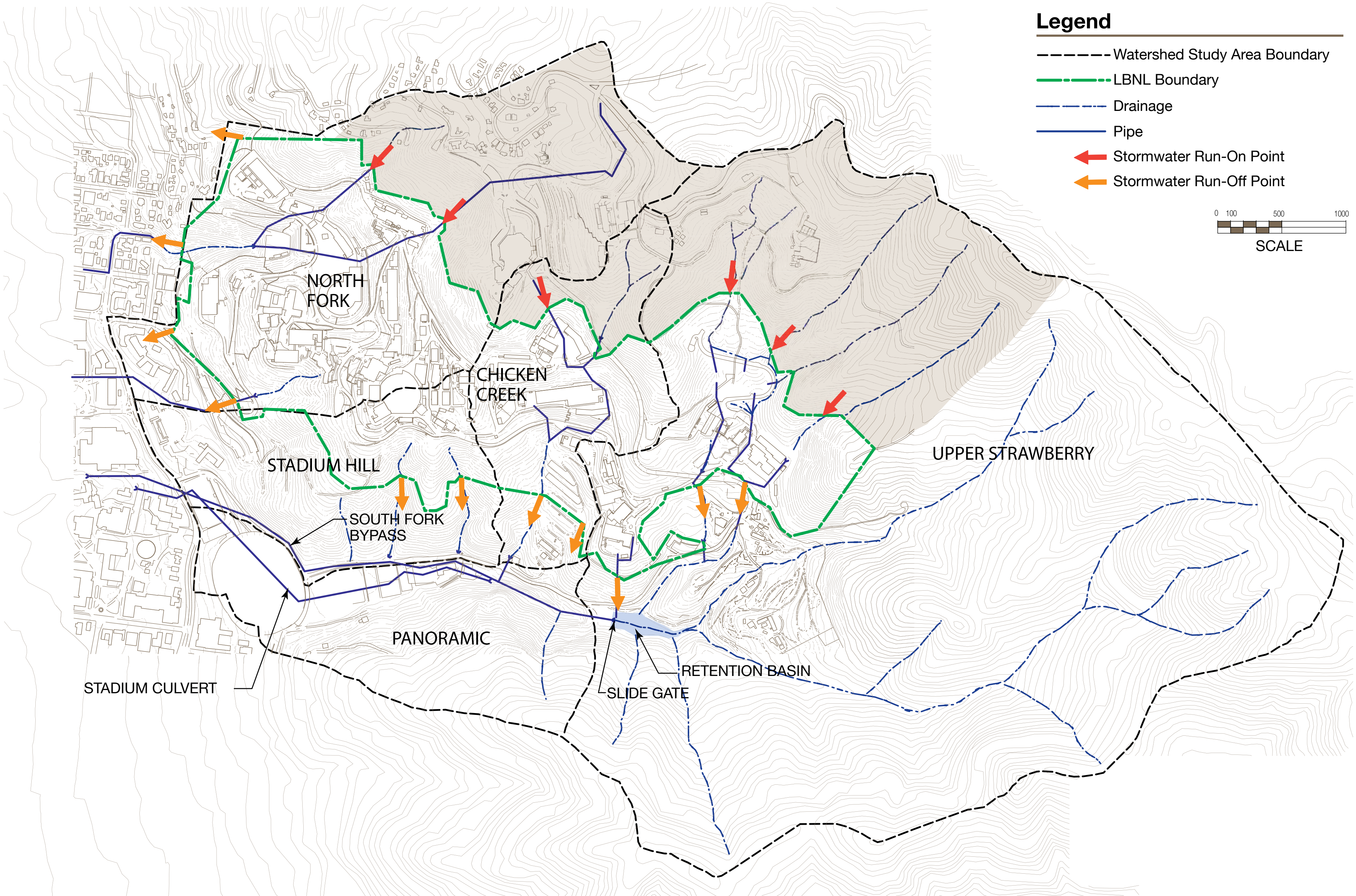
The North Fork begins in the Campus Hill Area near the Lawrence Hall of Science and flows west, crossing LBNL and exiting the Lab site at the bottom of Blackberry Canyon north of Building 65. The North Fork then passes through a series of check dams and settlement basins before entering a 60-inch culvert above LeConte Avenue in the City of Berkeley and then re-emerges as a surface stream on the UC Berkeley campus. The North Fork is a perennial creek and is partially supplied by hydrauger flows.[1] A few tributary drainages contribute to the North Fork, including Cafeteria Creek, an intermittent stream that is also partially supplied by hydrauger flows. The other contributing drainages are unnamed ephemeral streams.[2] The North Fork watershed contains 53 acres of developed area (of which 35 acres are within LBNL) and 117 acres of undeveloped area (of which 56 acres are within LBNL).

The South Fork of Strawberry Creek begins in the eastern end of Strawberry Canyon and flows west, through a retention basin above the Haas Pool complex (“mid-canyon retention basin”), and is then diverted through 36-inch and 48-inch diameter concrete pipes before re-emerging as a surface stream in the eastern portion of the UC Berkeley campus. Along the way, several tributary drainages contribute to flows in the South Fork. Above the mid-canyon retention basin, contributing subdrainages include Hamilton Creek (a perennial stream), Pineapple and Banana creeks (both ephemeral streams), and a few other unnamed ephemeral creeks. Below the mid-canyon retention basin, contributing subdrainages include “No Name” Creek (an intermittent stream), Chicken Creek (a perennial stream), Ten-Inch Creek and Ravine Creek (both ephemeral streams), and a few other unnamed ephemeral creeks.

The three sub-watersheds along the South Fork to which LBNL contributes are shown on Figure IV.G-4 and consist of Upper Strawberry Creek (508 acres), Chicken Creek (63 acres), and Stadium Hill (67 acres), for a total of 638 acres. A fourth sub-watershed, Panoramic (70 acres), is located on the south side of the canyon across from LBNL, and does not receive any runoff from LBNL (Huffman Broadway Group, Inc., 2004).

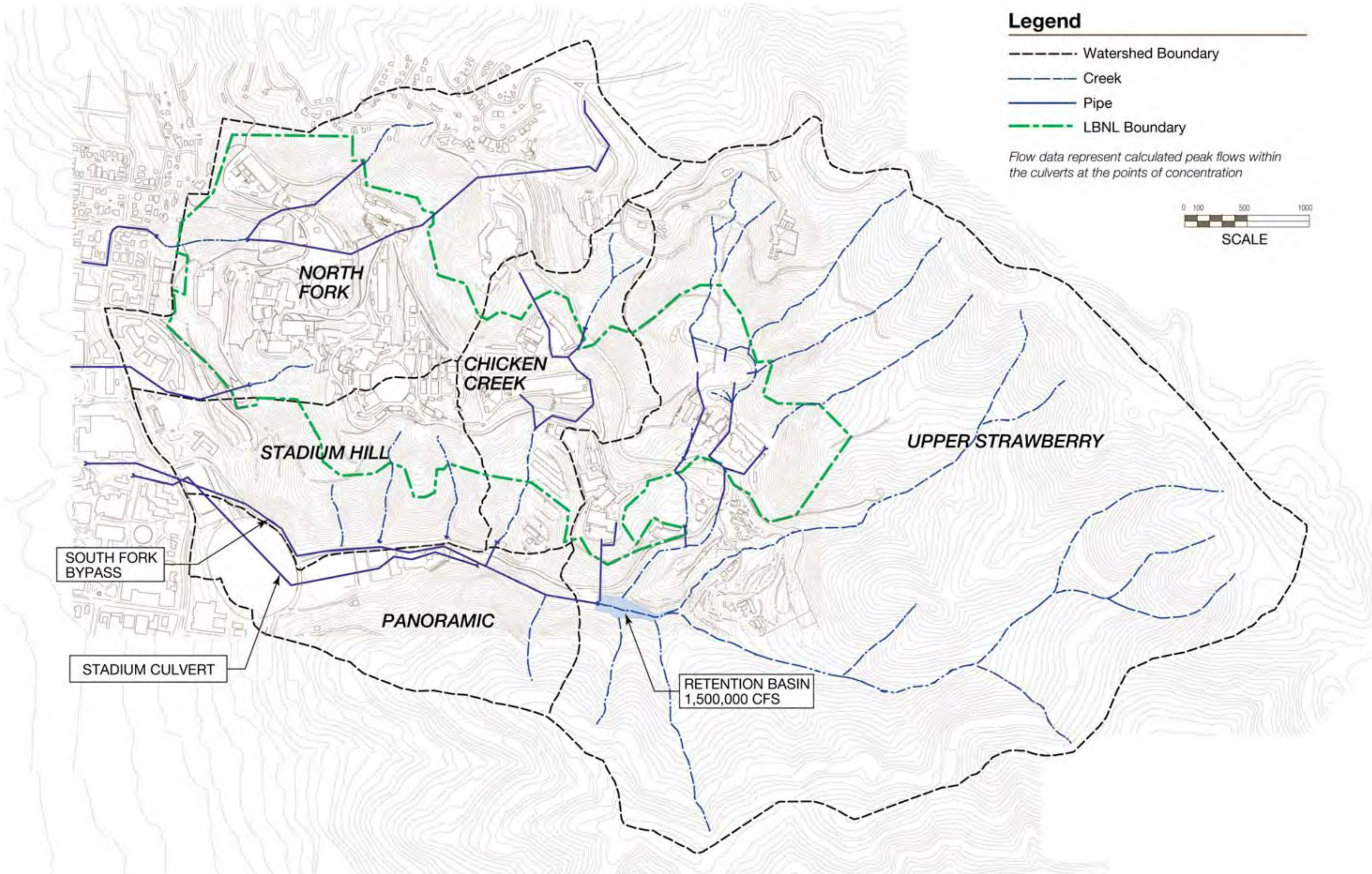
1 Hydraugers are horizontal drain pipes inserted into the hillside to draw off groundwater, some of which otherwise would eventually reach the natural drainage channels and which could, if not drained through by means of the hydraugers, result in slope instability where excessive moisture builds up in the soil.

2 An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Runoff from rainfall is the primary source of water for stream flow, and groundwater is not a source of water for the stream. An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow. A perennial stream has flowing water year-round during a typical year. Groundwater is the primary source and runoff from rainfall is a supplemental source of water for stream flow.



SOURCE: Lawrence Berkeley National Laboratory (2006)

Figure IV.G-3
Runoff from and Run-on to LBNL Site



SOURCE: Lawrence Berkeley National Laboratory (2003)

Figure IV.G-4
Strawberry Canyon Subwatersheds

The South Fork watershed consists of largely undeveloped, steeply sloped canyons and hillsides. Developed areas are generally confined to the residential areas and University property on the ridges and plateaus above the LBNL site, plus roads, the University's Botanical Garden, and LBNL itself. Within the watershed, there are 76 acres of developed area and 632 acres of undeveloped areas. Thirty-two acres of this developed area and 78 acres of this undeveloped area are within LBNL.

Surface waters and piped flows from development above the Laboratory run through the site. After leaving LBNL property within Strawberry Canyon, the majority of stream flow and surface runoff in the South Fork of Strawberry Creek is routed through a mid-canyon retention basin on University of California land, above the Haas Pool complex in the Upper Strawberry Creek sub-watershed. This retention basin is located at an elevation of approximately 600 feet and has an estimated flood storage capacity of 11 million gallons (1.5 million cubic feet) although the original design capacity has likely been reduced by siltation and vegetation growth (Kuntz, 2004). Surface water releases from the mid-canyon retention basin are remotely controlled by a hydraulically operated gate, thereby controlling flow rates downstream consistent with the design parameters of the storm drainage systems of UC Berkeley and the City of Berkeley. A substantial portion of the flow from LBNL's eastern area is captured by this retention basin prior to its further progress onto the UC Berkeley campus.

After flowing above ground for a short distance on campus the North and South Forks of Strawberry Creek converge on the western side of the UC Berkeley campus, east of Oxford Street, where they flow into one of three on-campus natural retention basins. These natural retention basins are (1) the West Circle Retention Area (North Fork flows only), (2) the Eucalyptus Grove Retention Area, and (3) the Oxford Inlet Retention Area. They perform important retention and flow moderation roles, and have prevented flooding on numerous occasions. Upon leaving the basins, flow is diverted underground through the Oxford Culvert and remains underground except for a short daylighted stretch in West Berkeley. Surface water flows from LBNL and the larger Strawberry Creek Watershed are ultimately discharged into San Francisco Bay south of the Berkeley Marina at the terminus of the storm drainage system that conveys Strawberry Creek through the City of Berkeley (LBNL, 2002).

Groundwater

Groundwater depths at LBNL vary from zero to approximately 100 feet below ground surface, usually depending on the season. Locally "perched"[3] groundwater and seeps are present. Groundwater flow patterns generally reflect site topography, with groundwater underlying the northwestern portion of the site flowing to the west, while groundwater elsewhere generally flows to the south. Flow velocities vary between approximately 0.003 feet per year to 990 feet per year (LBNL, 2005).

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3 "Perched" groundwater refers to water that sits atop an impermeable layer (rock, clay, etc.) at a lesser depth below grade than is representative of the overall groundwater table.

Historic development at LBNL has included the installation of hydraugers to facilitate hillside drainage and minimize saturation of steep slopes. Groundwater collected in hydraugers is subsequently directed into LBNL's storm drain system, with the exception of groundwater collected in areas surrounding Buildings 6, 7, 46, and 51, where contamination affecting groundwater quality has been found (LBNL, 2001). Flows from hydraugers in these areas are treated and the water is subsequently discharged to the sanitary sewer system, under a wastewater discharge permit from the East Bay Municipal Utility District (EBMUD).

Groundwater in the vicinity of LBNL is controlled by faults, subsurface geologic stratigraphy, and bedrock fractures. Groundwater flow through bedrock is typically characterized by fracture flow that has slow recharge and yield, while groundwater flow in the drainages is unconfined and fluctuates with seasonal precipitation. The soils that underlie the site allow for rapid to very rapid runoff, as discussed in Section IV.E, Geology and Soils, of this document.

LBNL is located above the East Bay Plain, an alluvial aquifer that supplies groundwater for municipal and industrial use. However, there are no production wells at Berkeley Lab, and LBNL and surrounding communities receive their water from EBMUD. The shallow soils located on steep slopes that exist across the majority of LBNL permit rapid runoff and likely do not allow for substantial levels of groundwater recharge to occur.

IV.G.2.2 Topographic Setting

Topographic elevations at LBNL range from approximately 450 to 1,100 feet above mean sea level (amsl). Although slope elevations generally decrease towards the west and south, a series of three main canyons and ridgelines results in a complex, varied topographic profile across the site. Approximately 60 percent of LBNL is located on slopes of greater than 25 percent.

IV.G.2.3 Flooding

The San Francisco Bay Area has a Mediterranean climate with cool, wet winters and warm, dry summers. LBNL receives approximately 30 inches of precipitation annually, 90 percent of which occurs in November through April (LBNL, 2002). The project site does not lie within the 100-year flood plain as determined by Federal Emergency Management Agency (FEMA) flood hazard mapping (ESRI-FEMA, 2004). There are no impounded water bodies upstream from the project site, and therefore flooding associated with failure of a dam is not anticipated to affect the site.[4]

Most of the existing storm drainage system at LBNL is sized to handle flows from a 100-year storm event (LBNL, 2002) based on a storm intensity of 2.95 inches of precipitation per hour. Future improvements to the storm drain system will continue to provide this 100-year storm capacity.

4 Potential impacts to the project site associated with flooding from seiches or tsunamis are analyzed as seismic hazards in Section IV.E, Geology and Soils, of this document, and were determined to be remote.

There are existing capacity constraints at the Oxford Culvert that pose a risk of flooding on Strawberry Creek “for downtown Berkeley, immediately west of Oxford Street, and to portions of the central UC campus. The North Fork of Strawberry Creek in particular is subject to flash flood conditions in periods of intense rainfall” (City of Berkeley, 2001).

The UC Berkeley campus area just upstream (east) of the Oxford inlet is shown on FEMA maps as being in the 100-year floodplain. This campus floodplain area functions as a retention basin to buffer flash storms and periods of heavy runoff when the capacity of the Oxford Street inlet is exceeded or the inlet becomes blocked by debris.

Since completion of the 11-million-gallon mid-canyon retention basin in Strawberry Creek and other improvements, through a range of usual storms, including El Nino events, there has been no recorded flooding from this inlet attributable to flow volume alone. Flooding onto city streets can, however, result when tree branches block the flow or other debris temporarily reroutes the surface channels. In 1995, such an event caused the creek to overtop its banks near the Oxford Street culvert and flow onto Oxford Street (UC Berkeley, 2004).

The mid-canyon retention basin was constructed to include an overflow flume; when water levels in the retention basin reach elevations of 594 feet, water is diverted onto Centennial Road. A rise in water levels sufficient to result in redirection to the overflow flume can be caused by several factors, including poor management of the slide gate that controls releases from the basin, plugging of the gate by debris, and storm events that generate a peak flow that exceeds the capacity of the system. During a 1997 storm, the gate was either plugged or closed too far, resulting in excessive water levels in the retention basin. The overflow flume is partially controlled by other wooden gates that allow access to Haas Pool complex. These gates were left open during the 1997 storm, and overflow water from the basin was directed into swimming pools rather than Centennial Drive (Kuntz, 2004). Improvements were subsequently made to the basin, and the gate control mechanism was relocated to a more accessible location after this event.

Minimization of stormwater runoff is one of the goals of the Alameda Countywide Municipal National Pollutant Discharge Elimination System (NPDES) Stormwater Permit. LBNL takes this goal into consideration in the design of new facilities, roads, and buildings, and to the extent possible considering topography and geology, minimizes impervious surfaces to reduce the rate of runoff using accepted design guidelines and best management practices (BMP), as described below.

IV.G.2.4 Water Quality

Within LBNL, the major potential sources of stormwater pollutants are motor vehicles and earthwork operations during construction. LBNL has had a stormwater management program in place since 1992. This program consists of a Storm Water Pollution Prevention Plan (SWPPP), plus periodic monitoring, inspecting, and reporting. More on this program is presented in the Regulatory Environment section that follows. Past releases of hazardous materials used at LBNL, not necessarily directly related to stormwater runoff, have affected groundwater underlying the project site, as discussed in Section IV.F, Hazards and Hazardous Materials, of this document.

Regionally, stormwater runoff is estimated to contribute more heavy metals to San Francisco Bay than direct municipal and industrial discharges do, as well as significant amounts of motor oil, paints, chemicals, debris, grease, and detergents. Runoff in storm drains may also include pesticides and herbicides from lawn care products and bacteria from animal waste. Most stormwater runoff flows untreated into creeks, lakes, and the bay. As point sources of pollution have been brought under control, the regulatory focus has shifted to nonpoint sources,[5] particularly urban runoff.

In 1987, UC Berkeley initiated a comprehensive study of Strawberry Creek (UC Berkeley, 1987). The study began as a water quality management plan, which was later expanded to urban creek and riparian habitat preservation and restoration. An update to the Strawberry Creek Management Plan is being developed by UC Berkeley to reflect progress resulting from program implementation and to expand the scope to address the Strawberry Creek Watershed as a functional eco-hydrological unit.

IV.G.2.5 Regulatory Environment

Regulations exist at both the state and federal levels for the control of surface water quality in California. The major federal legislation governing the water quality aspects of the project is the Clean Water Act. The objective of the Clean Water Act is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." The State of California's Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California. The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout the state, while the various Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and enforcement activities.

State and Regional Water Quality Control Boards

The primary responsibility for the protection and enhancement of water quality in California has been assigned by the California legislature to the SWRCB and the nine RWQCBs. The SWRCB provides state-level coordination of the water quality control program by establishing statewide policies and plans for the implementation of state and federal laws and regulations. The RWQCBs adopt and implement water quality control plans that recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems.

5 Point-source pollution is defined as pollution from industrial and sewage treatment plants. Nonpoint-source pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. Nonpoint-source pollution is caused by rainfall moving over and through the ground. As the runoff moves, it picks up and carries away natural and man-made pollutants, ultimately depositing them into lakes, rivers, wetlands, coastal waters, and even underground sources of drinking water.

The project area lies within the jurisdiction of the San Francisco Bay RWQCB, which has adopted the Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) to implement plans, policies, and provisions for water quality management. Beneficial uses of surface waters within the San Francisco Bay Region are described in the Basin Plan and are designated for major surface waters and their tributaries. Beneficial uses of the Central San Francisco Bay include ocean, commercial, and sport fishing, estuarine habitat, industrial service supply, fish migration, fish spawning, navigation, rare and endangered species preservation, recreation, shellfish harvesting, and wildlife habitat. None of the surface water bodies at LBNL, such as Strawberry Creek, has any designated beneficial uses in the Basin Plan.

Both the SWRCB and U.S. Environmental Protection Agency (EPA) Region IX have been in the process of developing new water quality objectives and numeric criteria for toxic pollutants for California surface waters since 1994, when a state court overturned the SWRCB's water control plans containing water quality criteria for priority toxic pollutants. The EPA's draft California Toxics Rule (CTR) was published in the August 5, 1997, Federal Register [62 FR 42159], with the Final Rule promulgated on May 18, 2000. The proposed criteria largely reflected the existing criteria contained in the EPA's 304(a) Gold Book (WQ Criteria 1986) and its National Toxics Rule adopted in December 1992 [57 Federal Register 60848], and those of earlier state plans (the *Inland Surface Waters Plan* and the *Enclosed Bays and Estuaries Plan* of April 1991, since rescinded). With promulgation of the Final CTR, these federal criteria are legally applicable in the State of California for inland surface waters including creeks at LBNL and enclosed bays and estuaries for all purposes and programs under the Clean Water Act.

Total Maximum Daily Load (TMDL) – Section 303(d) of the Clean Water Act

California has identified waters that are polluted and need further attention to support their beneficial uses. These water bodies are listed pursuant to Clean Water Act Section 303(d). Specifically, Section 303(d) requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). Approximately 500 water bodies or segments have been listed in California. Once the water body or segment is listed, the state is required to establish "Total Maximum Daily Load," or TMDL, for the pollutant causing the conditions of impairment. The TMDL is the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards. Listing of a water body as impaired does not necessarily suggest that the pollutants are at levels considered hazardous to humans or aquatic life or that the water body segment cannot support the beneficial uses. The intent of the 303(d) list is to identify the water body as requiring future development of a TMDL to maintain water quality and reduce the potential for continued water quality degradation.

In accordance with Section 303(d) of the Water Code, the San Francisco Bay RWQCB has identified impaired water bodies within its jurisdiction and the pollutant or stressor impairing water quality, and prioritized the urgency for developing a TMDL. While San Francisco Bay is included on the Section 303(d) list, Strawberry Creek is not. Pollutants or stressors identified on the Section 303(d) list for Central San Francisco Bay include chlordane, dichlorodiphenyltrichloroethane (DDT), diazinon, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, non-dioxin-like polychlorinated biphenyls (PCBs), PCBs (dioxin-like), and selenium.

A TMDL has been established for San Francisco Bay for mercury, and the RWQCB is working on TMDLs for the Bay for PCBs, pesticides, and selenium, as well as a revision to the mercury TMDL. The RWQCB has also adopted a TMDL for pesticide toxicity in urban creeks. (TMDLs are also being developed for other water bodies, such as the Napa River, Guadalupe River, and Sonoma Creek.) Although it is not anticipated that any future TMDLs would affect LBNL, due to lack of discharge of such substances, LBNL will comply with applicable regulations.

Construction Activity Permitting

The San Francisco Bay RWQCB monitors and enforces the NPDES stormwater permitting for the region. The SWRCB administers the NPDES Permit Program through its General NPDES Permit. Construction activities of one acre or more are subject to the permitting requirements of the NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit). The project sponsor must submit a Notice of Intent to the SWRCB in order to be covered by the General Permit prior to the beginning of construction. The General Construction Permit requires the preparation and implementation of a SWPPP, which must be prepared before construction begins. Components of SWPPPs typically include specifications for BMPs to be implemented during project construction for the purpose of minimizing the discharge of pollutants in stormwater from the construction area. In addition, a SWPPP includes measures to minimize the amount of pollutants in runoff after construction is completed, and identifies a plan to inspect and maintain project BMPs and facilities at the end of the construction project. This plan includes information regarding how the SWPPP was met.

Alameda County

In Alameda County, stormwater discharge from 17 participating agencies and cities, including the City of Berkeley, which ultimately receives runoff generated from within LBNL, is regulated by the Alameda Countywide Clean Water Program (ACCWP) under an NPDES permit issued by the San Francisco Bay RWQCB. The ACCWP has prepared and issued a 2001-2008 Stormwater Management Plan intended to reduce the discharge of pollutants in stormwater to the maximum extent possible and to effectively prohibit non-stormwater discharges into municipal storm drain systems and waterways. The Stormwater Management Plan includes a number of management practices and control techniques to reduce the discharge of pollutants in stormwater in Alameda County and addresses municipal government activities, new development controls, and stormwater treatment. The San Francisco Bay RWQCB renewed ACCWP's NPDES Permit on February 19, 2003 (SFBRWQCB, 2003). This permit renewal included revising Provision C.3 to require on-site treatment and storage of stormwater runoff for development projects that fall under certain use and size characteristics. As noted below under Local Plans and Policies, LBNL is generally exempt from local regulations but seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use to the extent feasible. For example, LBNL voluntarily makes an effort to comply with the provisions of the ACCWP NPDES permit that are above and beyond its own permit requirements so as to not negatively affect downstream entities.

LBNL Regulatory Compliance

LBNL's Storm Water Pollution Prevention Plan

Stormwater within the LBNL site is currently managed in conformance with the Statewide NPDES General Permit for Stormwater Discharges Associated with Industrial Activity (General Industrial Permit). Oversight and enforcement of this permit is provided by the San Francisco Bay RWQCB and the City of Berkeley. Implementation of the permit requirements is detailed in LBNL's SWPPP (LBNL, 2006) and Stormwater Monitoring Plan (LBNL, 2006). Additionally, LBNL complies with NPDES requirements associated with construction projects that involve one acre or more by applying for coverage under the State General Construction NPDES Permit. All post-construction activities at any project site comply with the General Industrial Permit.

LBNL's SWPPP describes best management practices used to protect stormwater quality. BMPs have been in place since the first general permit was issued by the state in 1992, and are regularly updated. Additionally, a master specification incorporating stormwater management among other environmental, health, and safety concerns is part of contract specifications on all construction projects undertaken by the site. LBNL manages stormwater to address issues such as natural debris and silt migration, slope stability and associated siltation issues, channel cutting and erosion, flow energy dissipation, run-on flow, and runoff retention, as described in more detail below.

LBNL's SWPPP lists potential sources of stormwater contaminants, including a comprehensive list of hazardous substances, chemicals, or other contaminants used throughout the facility. LBNL has implemented multiple source controls (such as containment systems for leak and spill control and maintenance of storm drains and streets to remove organic material and dirt) and management controls (such as preventive maintenance of equipment and the development of spill prevention and response programs) in order to minimize stormwater pollutants. However, treatment controls (such as oil-water separators and infiltration basins) have in the past generally not been used due to the effectiveness of source and management control measures (LBNL, 2002). Water quality samples are collected in accordance with LBNL's SWMP during the wet season, to demonstrate the effectiveness of LBNL's SWPPP and compliance with NPDES requirements (LBNL, 2001).

Stormwater Management

LBNL manages stormwater flows originating from sources upstream of the site and from within the site through engineering controls and management practices. Examples of engineering design features used to control surface water flow include:

- <u>Primary debris interceptors</u>. Structural steel tubes, evenly spaced and embedded in concrete across drainage channels, which remove heavy, floating items such as logs, limbs, stumps, and brush from storm runoff entering the LBNL site from upstream portions of the drainage. Primary debris interceptors prevent blockage of the storm system entrance and potential flooding; as debris collects on the interceptors, these features also function as local seasonal check dams by storing, slowing, and further dissipating energy of larger storm flows.

- Secondary debris interceptors. Heavy vertical grids of rebar spaced more closely together than primary debris interceptors to filter out smaller debris, constructed downstream from primary interceptors to further manage flows originating upstream of the site as they enter LBNL. Fiber rolls and similar instruments are typically placed seasonally at the secondary interceptors to help filter out suspended soil particles from runoff and act as smaller check dams, silting pools, and energy dissipaters.

- Rip-rap. Sharp-edged cobblestone typically placed at all entrances and outfall points in the storm drain system. Rip-rap is frequently cemented together and both dissipates energy and protects slopes and channels.

- Wing walls and head walls. Concrete walls used where open-channel flow enters a piping system to protect embankment and channel walls from erosion. Steel grates on the inlet structure also filter debris which may have bypassed the primary or secondary debris interceptors.

- Concrete v-ditches. Channels used in all earthwork projects along the tops of cut slopes and at intermediate benches on the face of the slope. V-ditches intercept surface runoff to keep the slope face from eroding and channeling.

- Jute mesh. Jute mesh installed on all slopes exposed by construction or grading activities on slopes steeper than 2:1 to prevent erosion until hydroseeding and/or ground cover is well established.[6] Mesh is pinned to the slope with long metal staples and typically reinforces the emerging grasslands for up to 7 years. Fiber rolls are staked at regular intervals across the faces of slopes to slow down and filter surface runoff.

- Down drains. Pipes that convey water down the face of slopes from a collection point at the top of the slope to a lower elevation at a stable outfall point to prevent erosion and damage to the slope face.

- Impervious, semi-pervious and pervious pavements, curbs, berms, and water dispersal systems. Surfaces that convey and control storm runoff to prevent runoff from eroding otherwise unprotected surfaces or from flowing down unprotected slopes.

LBNL's stormwater management practices would be instituted as feasible under LBNL's *Construction Standards and Design Requirements* and would include:

- Stormwater flow management. Management and physical channeling maximize use of the mid-canyon retention basin for both flow originating from development and lands above the site and flow generated within LBNL in order to minimize both localized and downstream impacts from storms.

- General planning. Opportunities to reduce stormwater flow impacts and further improve water quality are integrated into LBNL's overall planning. For example, to minimize impervious surface area per vehicle, LBNL encourages alternative transportation modes to further reduce parking needs and improve LBNL's Transportation Demand Management performance and shifts parking to lots (as opposed to roadside parking). Parking lots and structures can integrate oil/water separators and allow for better management of off-site flows.

[6] LBNL hydroseeds with a mixture of native grasses and forbs.

- Project siting and design. Evaluation of the quantity and quality of stormwater runoff is integrated into site planning and design so stormwater flows can be effectively managed. Residual increased flows from new impervious surfaces are ameliorated through project-related BMPs and use of the UC retention/management system. (Refer to BMPs under Impact HYDRO-1.)

- Landscape management. To improve slope stability and reduce erosion, LBNL's landscape management program improves the long-term health of tree stands and encourages native plants.

- Slope stabilization. Slope stabilization measures such as hydraugers and native vegetation reduce general sediment release and erosion and minimize slumps and resulting erosion and sediment production.

- Seasonal controls. Seasonal stormwater runoff controls, such as jute netting and fiber rolls, are installed to reduce sediment release and runoff along road edges and in the landscape. These are maintained by LBNL.

- Construction project controls. Active management of construction-related stormwater flows from development sites is a standard part of contract specifications on all construction projects undertaken by LBNL. Construction projects employ control measures and are monitored by LBNL to manage stormwater flows and potential discharge of pollutants.

- Elimination of all cross-connections. Labeling of stormwater inlets and minimization of sewer system infiltration have been undertaken to maintain clean stormwater flows.

- Publicizing program information. LBNL's annual Site Environmental Report is available to the public and provides an overview of recent actions and sampling results. LBNL also submits a stormwater annual report to the San Francisco Bay RWQCB and makes its SWPPP and SWMP available to the public.

- Engagement with the community. LBNL communicates with the community regarding Strawberry Creek water quality and coordinates with relevant UC Berkeley staff and management personnel on stormwater issues.

- Pollution prevention. LBNL actively promotes pollution prevention and good housekeeping for its Facilities Division operation and maintenance activities, and provides water quality training to Facilities personnel who regularly observe large portions of the site or operate equipment that may potentially discharge liquid. LBNL cleans stormwater inlets prior to the winter storm season and utilizes concrete clean-out basins, responds to any spill of oil, gasoline, or hazardous materials, and applies other, similar BMPs on an ongoing basis. An annual general site inspection ensures the effectiveness of these efforts. LBNL also maintains a Spill Prevention, Control, and Countermeasure (SPCC) plan that covers petroleum-containing tanks.

- Oil–water separators. These are used where an extra measure of protection is advisable, and will continue to be deployed where they can be used effectively.

- Permits. As noted above, LBNL obtained a stormwater permit at the inception of the NPDES program in 1992. LBNL's program is based on appropriate BMPs, and plans are periodically updated to reflect evolving knowledge and practices in this field. These measures, which are meant to reduce the quantity and improve the quality of stormwater runoff, consist of:

- – Public education and outreach on stormwater impacts;
- – Public involvement and participation;
- – Illicit discharge detection and elimination;
- – Pollution prevention/good housekeeping for facilities operation and maintenance;
- – Construction site stormwater runoff control; and
- – Post-construction stormwater management in new development and redevelopment.

A complete guide to LBNL's stormwater management measures can be found in the Lab's Storm Water Pollution Prevention Plan, which is posted on the internet at the following website: http://www.lbl.gov/ehs/esg/tableforreports/tableforreports.htm.

IV.G.2.6 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies in the Berkeley and Oakland general plans.

Berkeley General Plan

Berkeley General Plan policies pertaining to hydrology and water quality relevant to implementation of the LBNL LRDP include the following:

> Policy EM-23 Water Quality in Creeks and San Francisco Bay: Take action to improve water quality in creeks and San Francisco Bay.
>
> *Actions:*
>
> D) Restore a healthy freshwater supply to creeks and the Bay by eliminating conditions that pollute rainwater, and by reducing impervious surfaces and encouraging use of swales, cisterns, and other devices that increase infiltration of water and replenishment of underground water supplies that nourish creeks.
>
> F) Encourage the maintenance and restoration of creeks and wetlands and appropriate planting to cleanse soil, water, and air of toxins.
>
> Policy EM-24 Sewers and Storm Sewers: Protect and improve water quality by improving the citywide sewer system.
>
> E) Ensure that new development pays its fair share of improvements to the storm sewerage system necessary to accommodate increased flows from the development.
>
> F) Coordinate storm sewer improvements with creek restoration projects.
>
> Policy EM-25 Groundwater: Protect local groundwater by promoting enforcement of state water quality laws that ensure non-degradation and beneficial use of groundwater.

Policy EM-27 Creeks and Watershed Management: Whenever feasible, daylight creeks by removing culverts, underground pipes, and obstructions to fish and animal migrations.

Actions:

D) Restrict development on or adjacent to existing open creeks. When creeks are culverted, restrict construction over creeks and encourage design solutions that respect or emphasize the existence of the creek under the site.

F) Work in cooperation with adjoining jurisdictions to jointly undertake creek and wetland restoration projects, to improve water quality and wildlife habitat, to allow people to enjoy creeks as part of urban open space.

G) Regulate new development within 30 feet of an exposed streambed as required by the Creeks Ordinance and minimize impacts on water quality and ensure proper handling of stormwater runoff by requiring a careful review of any public or private development or improvement project proposed in water sensitive areas.

H) Consider amending the Creek Ordinance to restrict parking and driveways on tops of culverts and within 30 feet of creeks.

Policy S-27 New Development: Use development review to ensure that new development does not contribute to an increase in flood potential.

Actions:

C) Require new development to provide for appropriate levels of on-site retention of stormwater.

D) Regulate development within 30 feet of an exposed streambed as required by the Preservation and Restoration of Natural Watercourses (Creeks) Ordinance.

Oakland General Plan

The Open Space, Conservation and Recreation Element of the Oakland General Plan, adopted in 1996, addresses the management of open land, natural resources, and parks in Oakland.

Open Space Objective OS-8 is "To conserve open space along Oakland's creeks, restoring the creeks where feasible and enhancing creek access on public lands." The following policies are relevant to the proposed project:

Policy OS-8.2 Creek Daylighting: Support programs to restore or "daylight" sections of creek that have been culverted or buried in the storm drain system, provided that the following conditions exist: (1) broad-based community support for the project; (2) availability of financial resources for the project; and (3) no significant health, safety, flooding, or erosion hazards would result from the project. Place priority for daylighting on properties where additional opportunities for recreational access would be created.

Conservation Objective CO-5 is "To minimize the adverse effects of urbanization on Oakland's groundwater, creeks, lakes and nearshore waters." The following polices are relevant to the proposed project:

Policy CO-5.2 Improvements to Groundwater Quality: Support efforts to improve groundwater quality, including the use of non-toxic herbicides and fertilizers, the

> enforcement of anti-litter laws, the clean-up of sites contaminated by toxics, and ongoing monitoring by the Alameda County Flood Control and Water Conservation District.

> Policy CO-5.3 Control of Urban Runoff: Employ a broad range of strategies, compatible with the Alameda Countywide Clean Water Program, to: (a) reduce water pollution associated with stormwater runoff; (b) reduce water pollution associated with hazardous spills, runoff from hazardous material areas, improper disposal of household hazardous wastes, illicit dumping, and marina "live-aboards"; and (c) improve water quality in Lake Merritt to enhance the lake's aesthetic, recreational, and ecological functions.

Conservation Objective CO-6 is "To protect the ecology and promote the beneficial uses of Oakland's creeks, lakes, and nearshore waters." The following polices are relevant to the proposed project:

> Policy CO-6.1 Creek Management: Protect Oakland's remaining natural creek segments by retaining creek vegetation, maintaining creek setbacks, and controlling bank erosion. Design future flood control projects to preserve the natural character of creeks and incorporate provisions for public access, including trails, where feasible. Strongly discourage projects that bury creeks or divert them into concrete channels.

IV.G.3 Impacts and Mitigation Measures

IV.G.3.1 Significance Criteria

The impact of LBNL projects on hydrology and water quality would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the state CEQA Guidelines and the UC CEQA Handbook:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;

- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Cause inundation by seiche, tsunami, or mudflow.

IV.G.3.2 Impact Assessment Methodology

Potential impacts were analyzed based on existing hydrology data and anticipated physical growth under the 2006 LRDP.

Due to site characteristics and the scope of the LRDP, significance criteria associated with placing of housing or other structures within a 100-year flood hazard zone are not relevant to the proposed project. As previously noted, LBNL is not located within a 100-year flood zone. As also previously discussed, LBNL's steep slopes, shallow bedrock, and thin soils presently inhibit significant groundwater recharge of the East Bay Plain, and therefore potential groundwater recharge and supply impacts associated with the project are not considered significant. Potential impacts associated with inundation by seiche or tsunami are not considered significant due to the elevation and location of LBNL relative to the Pacific Ocean and enclosed water bodies, as discussed in Section IV.E, Geology and Soils, of this document. There are no water supply wells on the LBNL main hill site.

If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3).

IV.G.3.3 2006 LRDP Principles, Strategies and LBNL Design Guidelines

2006 LRDP Principles and Strategies

The 2006 LRDP proposes fundamental principles that form the basis for the Plan's development strategies. The three principles most applicable to hydrology and water quality as related to new development are to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship"; "Build a safe, efficient, cost effective scientific infrastructure capable of long-term support of evolving scientific missions"; and "Build a more campus-like research environment."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP (see Chapter III, Project Description for further discussion, and see Appendix B for a full listing of principles, strategies and design guidelines). Development strategies set forth in the 2006 LRDP applicable to hydrology and water quality include the following:

- Protect and enhance the site's natural and visual resources, including native habitats, streams and mature tree stands by focusing future development primarily within the already developed areas of the site.
- Increase development densities within the most developed areas of the site to preserve open space, and enhance operational efficiencies and access.
- To the extent possible site new projects to replace existing outdated facilities and ensure the best use of limited land resources.
- To the extent possible site new projects adjacent to existing development where existing utility and access infrastructure may be utilized.
- Site and design new facilities in accordance with University of California energy efficiency and sustainability policies to reduce energy, water, and material consumption and provide improved occupant health, comfort, and productivity.
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory.
- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates.
- Reduce the percentage of parking spaces relative to the adjusted daily population.
- Consolidate parking into larger lots and/or parking structures, and locate these facilities near Laboratory entrances to reduce traffic within the main site.
- Remove parking from areas targeted for outdoor social spaces and service areas.
- Consolidate service functions wherever possible in the Corporation Yard.
- Utilize native, drought-tolerant plant materials to reduce water consumption; focus shade trees and ornamental plantings at special outdoor use areas.
- Minimize impervious surfaces to reduce storm water run-off and provide landscape elements and planting to stabilize slopes, reduce erosion and sedimentation.
- Maintain a safe and reliable utility infrastructure capable of sustaining the Laboratory's scientific endeavors.
- Design infrastructure improvements to embody sustainable practices.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provide the following specific planning and design guidance relevant to hydrology and water quality:

- Minimize impacts to disturbed slopes.
- Minimize further increases in impermeable surfaces at the Lab.
- Minimize visual and environmental impacts of new parking lots.

IV.G.3.4 Construction[7] and Demolition Impacts

Impact HYDRO-1: Construction pursuant to the LRDP, including earthmoving activities such as excavation and grading, could result in soil erosion and subsequent sedimentation of stormwater runoff or an increase in stormwater pollutants associated with construction-related hazardous materials. (Less than Significant)

Construction-related grading and other activities for all development under the LRDP would follow the Association of Bay Area Governments' (ABAG) Manual of Standards for Erosion and Sediment Control Measures (ABAG, 1995) and the California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbook for Construction (CASQA, 2003a). In addition, construction would comply with LBNL's standard stormwater management practices and engineering controls, which require the control and minimization of stormwater pollutants originating from construction sites as a standard part of contract specifications. Disturbed areas would be landscaped and re-seeded at the earliest practical time during construction so that ground cover would be well-established by the next rainy season, as required by Mitigation Measures GEO-3a and GEO-3b, presented in Section IV.E, Geology and Soils. Landscaping would begin as soon as surface disturbances are completed for each relevant area. Implementation of these measures is anticipated to effectively control sedimentation and pollutants in stormwater from construction sites that encompass less than one acre.

Individual projects constructed (or demolished) under the LRDP that involve one acre or more would require LBNL to apply for coverage under the State General Construction NPDES permit, and development of a project-specific SWPPP would therefore be required. As part of the SWPPP, a project-specific erosion control plan would be included in the project design process and implemented during construction to reduce short-term water quality impacts associated with construction. The SWPPP would include the use of BMPs to minimize stormwater pollution from sediments and construction-related contaminants. Such BMPs would include, as feasible:

- The covering of excavated materials.
- Installation of silt traps, fencing, and use of filter fabric as measures to control erosion and sedimentation and prevent such materials from entering surface water discharges.

[7] For the purposes of this EIR, the term "construction," unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

- Truck and construction equipment maintenance and storage to minimize pollutants.
- Construction and hazardous materials storage.
- Housekeeping measures.
- Prohibition of cement truck washout to LBNL drains and surfaces.
- Oversight throughout construction by LBNL engineers and environmental specialists.

Compliance with NPDES permit requirements, which include creation of project-specific SWPPPs and, ultimately, implementation of BMPs that would minimize soil erosion and subsequent sedimentation of stormwater runoff or increased stormwater pollution associated with construction hazardous materials, as discussed above, and LBNL's standard stormwater management practices and engineering controls would ensure that potential adverse impacts to surface waters associated with construction under the LRDP would be less than significant.

Mitigation: None required.

Project Variant. The project variant would not result in any change in buildings or structures developed, and therefore impacts would be the same as those described for the proposed project.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to hydrology and water quality. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would not result in substantial effects with regard to soil erosion, stormwater sedimentation, or construction-related pollution of stormwater, and the impacts of these specific projects would also be less than significant.

IV.G.3.5 Operations Impacts

Impact HYDRO-2: Implementation of the 2006 LRDP would adversely affect stormwater quality. (Less than Significant)

Urban runoff can carry a variety of pollutants, such as oil and grease, metals, sediment, and pesticide residues from roadways, parking lots, rooftops, and other surfaces, and deposit them in adjacent waterways. Pollutant concentrations in urban runoff are extremely variable and are dependent on storm intensity, land use, elapsed time between storms, and the volume of runoff generated in a given area that reaches a receiving water. The most critical time for urban runoff effects is in autumn under low flow conditions. Pollutant concentrations are typically highest during the first major rainfall event after the dry season, known as the "first flush."

The LRDP proposes to address transportation impacts through improvements for both private vehicles and alternate modes of transportation. The LRDP would add up to a net total of 500 employee parking spaces to the 2,300 existing parking spaces. To provide additional parking within the topographic constraints of LBNL, the LRDP anticipates that the majority of these new parking spaces would be sited in two parking structures as identified in the Illustrative Development Scenario. These parking structures would contain about 850 parking spaces, and would consolidate a substantial portion of existing roadside parking. New surface lots would consolidate other parking spaces currently located alongside Lab roadways. Increased surface parking areas could create new sources for collection of vehicle-related pollutants. Along with the incremental increase in pollutant loading from the creation of new impervious surfaces associated with general facility development, these parking areas could contribute to degradation of surface water quality by adversely affecting runoff leaving the site. However, because the LRDP anticipates that nearly 40 percent of all parking would be in multi-level parking structures, large areas of new parking would not be exposed to rainfall, and therefore the potential for additional contaminants entering stormwater runoff would be reduced, compared to existing conditions, under which all parking is exposed to the elements.

Implementation of the 2006 LRDP would incrementally intensify urban uses at the site. The 2006 LRDP foresees an increase in the average daily population on the main site, which would affect LBNL's transportation facilities and services, and require the construction of new buildings consistent with the mission of the Laboratory. Approximately 10 acres[8] of impervious surfaces would be added to the site.

Pollutant concentrations under the LRDP may increase due to the increase in vehicles, impervious surface area, and hazardous material use. To manage the amount of pollutants entering the storm drain system or surface water bodies at LBNL, and subsequently Strawberry Creek and the San Francisco Bay, the inclusion of control measures directed toward future development and facilities into LBNL's existing SWPPP and SWMP is part of the proposed project. In compliance with the provisions of the Clean Water Act, LBNL will implement relevant standards from the LBNL NPDES General Industrial Permit and associated SWPPP and SWMP, implement appropriate source control measures as recommended in the California Stormwater Best Management Practice Handbook for New Development and Redevelopment (CASQA, 2003b), and preserve existing pervious surfaces to the greatest extent practicable to minimize the amount of storm runoff, in accordance with the recommendations provided in the Bay Area Stormwater Management Agencies Association (BASMAA) *Start at the Source Design Guidance Manual for Stormwater Quality Protection* (BASMAA, 1999). In this way, LBNL is expected to comply with the Clean Water Act while still meeting the need for more usable space at the Lab.

8 A projection of approximately 10 acres of new impervious surface is calculated based on the aggregate increase of building, parking lot, and road surface area as posited under the Illustrative Development Scenario.

Among the Objectives and Design Guidelines included in the 2006 LRDP are the following that would reduce potential hydrological impacts of development pursuant to the LRDP:

- To the extent possible, site new projects to replace existing outdated facilities and ensure the best use of limited land sources.
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory.
- Consolidate parking into larger lots and/or parking structures; locate these facilities near Laboratory entrances to reduce traffic within the main site.
- Minimize impervious surfaces to reduce storm water run-off and provide landscape elements and planting to stabilize slopes and reduce erosion and sedimentation.

As noted, the proposed parking structures would result in less of a contribution to pollutant loading of stormwater runoff than a comparable amount of surface parking, as predominantly only rooftop parking would be exposed to rainfall, thereby reducing the potential for oil and grease from the covered areas to enter the watershed. In accordance with LBNL's stormwater engineering controls and management practices referenced above, and implemented in accordance with the LBNL *Construction Standards and Design Requirements*, runoff from parking structures built pursuant to the LRDP would be filtered as required to remove oil and grease prior to discharge. This can be accomplished through mechanical systems such as pre-manufactured oil-water separators or through natural processes such as bioswales and settlement ponds. Due to the steep terrain of the project site, bioswales or settlement ponds are not likely to be practicable in many locations. Oil and sediment separators or absorbent filter systems would be designed and constructed to reduce water quality impacts from urban runoff. The performance of the filters would be monitored regularly to determine the effectiveness of the water treatment. In addition to treating pollutants originating from parking structures, LBNL would implement structural and treatment best management practices commonly used to reduce sediment and contaminant concentrations, including the use of grass strips, high infiltration substrates, and grassy swales to reduce runoff and provide initial stormwater filtration, and the use of retention basins to allow for infiltration and settling of sediments. These features would be included in proposed projects and implemented where practicable.

Compliance with LBNL's NPDES permit and associated SWPPP and SWMP, implementation of the LRDP design guidelines and development principles, and continued implementation of engineering controls and standard management practices would ensure that potential stormwater quality impacts associated with the LRDP are less than significant.

Mitigation: None required.

Project Variant. The project variant would not result in any change in buildings or structures developed, and therefore impacts would be the same as those described for the proposed project.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to hydrology and water. Potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would result in effects on stormwater quality that would be less than significant for the reasons stated above.

Impact HYDRO-3: Implementation of the LRDP would increase stormwater runoff rates and volumes, potentially resulting in erosion of creek channels or downstream flooding. (Less than Significant)

Stormwater runoff from both LBNL and the UC Berkeley campus enter the City of Berkeley storm drain system at the western edge of the UC Berkeley campus, at Oxford Street. As detailed below, while growth under the 2006 LRDP would slightly increase the total volume of runoff from the LBNL site, there would be a less than proportional increase in stormwater runoff peak flows leaving the LBNL site and entering the municipal storm drain system. Thus, impacts from increases in the quantity of stormwater runoff would be less than significant.

Projects at Berkeley Lab would be sited and designed so that stormwater flows could be effectively managed through (1) the use of BMPs at sites of new projects, (2) the use of BMPs at other locations on the Laboratory site, (3) the use of the mid-canyon retention basin to detain and control downstream releases of stormwater, and/or (4) joint BMP projects with UC Berkeley. In addition, the Laboratory would continue to maintain, periodically replace, and upgrade portions of its stormwater management system under its maintenance and capital renewal programs. These siting and management considerations would be undertaken as part of LBNL's standard project site selection process and design review process. These considerations are an integral part of the LRDP and would be instituted, as appropriate, in *LBNL Construction Standards and Design Requirements*.

Implementation of the LRDP would add approximately 10 acres of impervious surfaces at LBNL, increasing the amount of impervious surface from 67 to 77 acres across the 202-acre LBNL site. This increased impervious surface area would constitute about 1.1 percent of the 878-acre Strawberry Creek watershed pertinent to LBNL, and would only slightly increase peak flows by about 10 cfs, or about 0.6 percent, over the current estimated total of 1,686 cfs (Table IV.G-1) generated in this watershed during a 100-year storm event (Blair, 2006). Berkeley Lab would work with UC Berkeley to ensure that the retention basin is routinely maintained to ensure that its retention capacity is maximized.

Four of these 10 new acres of impervious surfaces would be located within the Upper Strawberry Creek sub-watershed. Peak flows from these four acres would total about 4 cfs, and would flow to the 11-million-gallon mid-canyon retention basin described earlier. This retention basin, which has ample capacity to contain and gradually release the water retained there, can handle runoff up to and including that from a 100-year storm event. Even though the volume of water entering this basin would increase by 4 cfs during peak flow, the basin's unused capacity and relatively slow release of runoff water would mean that this increase would not exceed the capacity of the downstream municipal storm drainage system (Blair, 2006).

The remaining six acres of new impervious surfaces would be divided between the North Fork of Strawberry Creek (4.1 acres) and Chicken Creek (1.9 acres) sub-watersheds. The estimated additional runoff generated from these areas would increase peak flows by 6 cfs, an increase of about 0.4 percent over the current total from the 878-acre watershed pertinent to LBNL. Compared to the runoff from the entire 2,066-acre Strawberry Creek Watershed, this represents an increase of approximately 0.1 percent. The Laboratory would offset this already small increase in peak flows through use of design policies and BMPs at the sites of new development and/or at other locations, required as part of the Lab's siting and design review processes and integral to the LRDP, which would retard peak flows and otherwise reduce their effects. Depending on site-specific conditions, these would include such things as innovative design elements, such as energy dissipaters, vegetated swales, and settlement basins, to minimize erosion; converting surfaces that presently are impervious to pervious surfaces; diverting runoff that presently does not go to the mid-canyon retention basin to that basin; and temporarily retaining a portion of rainfall at the project site or the immediate area for later, gradual release. These efforts would ensure that, as would be the case for increased peak flows from development in the Upper Strawberry Creek sub-watershed, peak flows from new development in these sub-watersheds would not exceed the capacity of the municipal storm drainage system.

As a result of the above measures, there would be no or negligible effects on erosion and downstream flooding, or other impacts to beneficial uses, and impacts would be less than significant.

Mitigation: None required.

Project Variant. The project variant would not result in any change in buildings or structures developed, and therefore impacts would be the same as those described for the proposed project.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of erosion impacts. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would result in no or negligible effects on erosion and downstream flooding or other beneficial uses and the impacts would be less than significant.

IV.G.3.6 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex—housing the Bevatron accelerator—is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken. Certification of the Building 51 (Bevatron) EIR and approval of the demolition project are anticipated to be considered in early 2007.) Additional projects currently underway at UC Berkeley, described in Section VI.C of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis is the Strawberry Creek Watershed. Because Strawberry Creek and its tributaries drain through LBNL, UC Berkeley, and the City of Berkeley, the analysis considers development in those areas and not exclusively at LBNL. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.G-18) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact HYDRO-4: Implementation of the LRDP, when combined with implementation of the UC Berkeley 2020 LRDP and other cumulative development, would not result in significantly adverse hydrologic or water quality impacts. (Less than Significant)

Implementation of the LBNL LRDP and UC Berkeley LRDP would have similar programmatic level results, as both projects would be required to comply with NPDES permit regulations to minimize short-term and long-term degradation of stormwater runoff. Peak flows to the municipal storm drainage system that begins at Oxford Street would not increase significantly as a result of the LBNL LRDP. Therefore, any cumulative impacts would largely be the result of other development. The City of Berkeley General Plan indicates that no significant changes to roadways or the residential pattern in the Upper Strawberry Creek sub-watershed are anticipated. The UC Berkeley 2020 LRDP does not identify any specific projects to be developed on the UC Berkeley-managed lands in this upper watershed area. The UC Berkeley 2020 LRDP projects that approximately 100,000 gross square feet of multi-story building space might be constructed somewhere on UC Berkeley-managed lands in the hill area, but this plan notes that on-site stormwater management features will be incorporated so that there will be no increase in net stormwater runoff flows from the hill site. Similarly, the UC Berkeley LRDP notes that any further development by UC Berkeley on the central campus and adjacent lands will not increase stormwater flows. Neither the UC Berkeley LRDP nor the City of Berkeley General Plan proposes revegetation actions in the hill area; only ongoing annual fire management work is planned. The City of Berkeley is engaged in a multi-decade project to reduce infiltration to their storm sewer system. This latter effort may result in some modest reduction in storm sewer flows in this drainage system over time. Finally, the EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) finds that, with mitigation, the SCIP would neither result in significant hydrological impacts, nor contribute considerably to cumulative hydrologic impacts (UC Berkeley, 2006).

Potential cumulative hydrologic and water quality impacts associated with the proposed LRDP are therefore considered less than significant. Furthermore, other development in the area and the region that could contribute to water quality impacts on San Francisco Bay, for example, would be subject to similar programmatic requirements (NPDES permit regulations, stormwater pollution prevention plans, etc.), thereby further reducing the potential for cumulative adverse impacts.

Mitigation: None required.

Project Variant. The project variant would result in hydrology and water quality impacts substantially similar to the hydrology and water quality impacts that would result from the 2006 LRDP development. The cumulative hydrology and water quality impacts of the project variant would therefore be less than significant as described above.

Individual Future Project/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. A future project under the LRDP such as conceptually portrayed in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development as discussed above, would also, for the reasons stated above, result in cumulative hydrology and water quality impacts that would be less than significant.

IV.G.4 References – Hydrology and Water Quality

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IV.H. Land Use and Planning

IV.H.1 Introduction

This section evaluates the potential land use and planning impacts of the proposed 2006 LRDP. The section reviews existing land use at the project site and relevant land use plans, policies, and regulations governing the project area affected by the LRDP. As stated earlier, although LBNL is exempt from compliance with local planning and zoning requirements, the EIR analyzes the consistency and potential conflicts of the 2006 LRDP with relevant local agency land use plans, policies, and regulations.

IV.H.2 Setting

IV.H.2.1 Project Site Location

The Lab's hill site covers approximately 200 acres in the eastern hills of Berkeley and Oakland. The site is largely buffered by undeveloped land owned by the University of California, although the northwest corner of the Lab generally abuts residential neighborhoods in the City of Berkeley.

Access to the Lab's hill site is limited to three controlled-access vehicular gates on Cyclotron Road (the main Blackberry Canyon Gate) and Centennial Drive (the Strawberry Canyon and Grizzly Peak gates), all of which are staffed by an on-site security firm contracted by LBNL. Visitors primarily use the Blackberry Canyon Gate. The Grizzly Peak Gate is an exit-only gate after the morning commute hours.

IV.H.2.2 Expansion of LBNL Site

Since LBNL last updated its LRDP in 1987, the Lab's hill site has increased in size by 50 percent, from 134 acres to 202 acres, due to the transfer of management responsibility for some University land from UC Berkeley to LBNL. As described in the Land Use section of the Lab's 1997 SEIR Addendum, the transfer of management was arranged to enable the Lab to implement a fuel management program to reduce risk of building damage from wildland fire, to facilitate more effective overall management of The Regents' land in this area, and to support the orderly development of the Lab site.

The additional acreage now under the Lab's management is generally within two distinct areas. The first area is along the southern perimeter of the Lab where it adjoins the UC Berkeley campus; the Lab has assumed jurisdiction over a swath of undeveloped land approximately 500 feet wide, on average, from the horseshoe curve of Cyclotron Road on the west, across the Berkeley-Oakland border to the curve of Lee Road around the southern edge of Building 62. The second area of expansion is at the eastern edge of the Lab, where LBNL has assumed control of an approximately 1,000-foot perimeter of undeveloped land to the north and east of the Lab's Life Sciences Cluster (Buildings 74, 83, 84, 85, and 85B). LBNL also has jurisdiction over land on both sides of Centennial Drive as the road makes its way uphill toward the Lawrence Hall of

Science, although access to Centennial Drive itself is not controlled because the roadway crosses above internal Lab roadways via an overpass.

IV.H.2.3 Surrounding Land Uses

LBNL is surrounded by a mix of land uses including open space, institutional, residential, and commercial uses. Northeast of the central portion of the hill site, located on the slopes above the Lab, are the Lawrence Hall of Science, the UC Berkeley Space Sciences Laboratory, and the UC Berkeley Mathematical Sciences Research Institute. These buildings and adjacent property are owned by the University of California and are publicly accessible via Centennial Drive. To the north, northwest, and west of LBNL are residential neighborhoods and a neighborhood-serving commercial area, centered on Euclid Avenue, within the city of Berkeley. Southwest of LBNL is the 1,230-acre UC Berkeley campus. Southeast of LBNL are the open space areas of Strawberry Canyon, also owned by the University of California. Land to the east, northeast, and southeast of LBNL consists primarily of open space, including the University of California's ecological study areas and the UC Berkeley Botanical Gardens. Northeast of LBNL is the 2,000-acre Tilden Regional Park and to the south is the 205-acre Claremont Canyon Regional Preserve, both of which are owned and managed by the East Bay Regional Park District.

IV.H.2.4 On-Site Land Uses

Existing land use at the approximately 200-acre hill site can be categorized as follows: Research and Academic (116 acres, or 57 percent of the overall site); Central Commons (six acres, or three percent of the site); Support Services (15 acres or eight percent of the site); and Perimeter Open Space (66 acres or 32 percent of the site). Existing buildings at the LBNL hill site contain approximately 1.76 million square feet of floor area, generally divided among four major categories: heavy-duty laboratories (approximately 14 percent of building space), wet and dry laboratories (14 percent), office space (22 percent), and other uses (50 percent). A general description of each category is provided below. Additional facility uses not included in the building square footage consist of infrastructure for utilities (e.g., on-site electricity, gas, and water distribution systems), roadways, and parking lots.

Heavy-Duty Laboratories

The heavy-duty laboratories for advanced research-equipment fabrication and operation house current and next-generation accelerators, particle storage rings for electrons and heavy ions, extensions to experimental halls, and facilities for advanced detectors. These facilities must meet requirements for ceiling height, floor loading, crane capacity, and cleanliness that are typical of LBNL's modern heavy-duty laboratory needs.

Wet and Dry Light-Duty Laboratories

The wet (plumbed with water and sinks) and dry laboratories for specialized and general-purpose needs include, for example, facilities with clean-room operating standards and with small-scale isotope-handling capability. Additional uses for the wet and dry laboratories include molecular genetics studies on the human genome, bioreactor testing and development, chemical reaction dynamics studies, and lighting technology research.

Office Space

Office space is located near laboratories and shops to meet program requirements. Of the current office space, 31,000 square feet consist of temporary buildings. The office space land use category also accounts for conference rooms, cubicle space, file rooms, storage space, and additional uses related to general office functions.

Hazardous Waste and Material Handling

Transportation, use, storage, treatment, and disposal of LBNL's hazardous materials, as well as the potential releases of hazardous materials to the environment, are closely regulated by agencies including the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). LBNL manages the storage and treatment of hazardous wastes at its Hazardous Waste Handing Facility (HWHF), which operates under a permit issued by DTSC. LBNL has an additional hazardous waste permit to operate five fixed treatment units (FTUs). The FTUs are operated independently of the HWHF, and the City of Berkeley administers the FTU permitting program under its Certified Unified Program Agency program authority. LBNL's waste management program sends hazardous, mixed, medical, and radioactive waste generated at the Laboratory off-site for treatment, recycling, or disposal, depending upon the particular waste in question. See Section IV.F, Hazards and Hazardous Materials, for further discussion of these facilities and programs.

Other Uses

Other uses include shop facilities for mechanical and electronics instrumentation, computer facilities, storage space, auditorium and conference space, and a number of other miscellaneous uses. This category also includes support space for technology-transfer activities, meeting facilities, visitor accommodations, cafeteria operations, and other functions.

IV.H.2.5 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies contained in the Berkeley and Oakland general plans.

Berkeley General Plan

The City of Berkeley Draft General Plan was published in October 2000; on December 18, 2001, the Berkeley City Council certified the Draft General Plan EIR and approved the Housing, Land Use, and Transportation Elements. In spring 2002, the City Council approved the six remaining elements of the General Plan.

The Berkeley General Plan assigns land within the city to one of 12 land use designations. The LBNL site is designated as "Institutional," which includes institutional, government, educational, recreational, open space, natural habitat, woodlands, and public service uses and facilities, such as the University of California, Bay Area Rapid Transit District, Berkeley Unified School District, and East Bay Municipal Utility District facilities. Within these areas, building intensity generally ranges from a floor area ratio (FAR) of less than 1 to a FAR of 4.[1] The current FAR of the Berkeley Lab site is approximately 0.2.

The Land Use Element of the Berkeley General Plan contains comprehensive objectives and policies that guide physical development in the city. One objective of the Land Use Element is to "minimize the negative impacts and maximize the benefits of University of California on the citizens of Berkeley." About 95 acres, or almost half of the LBNL site, is within the city of Berkeley. As noted above, LBNL is not subject to local land use regulations and policies, but seeks consistency with local plans and policies where feasible. Berkeley General Plan land use policies pertaining to the proposed LBNL 2006 LRDP are as follows:

> Policy LU-38 University Impact on City Tax Revenue: Discourage to the maximum extent possible additional use of land by the University that would result in the removal of property from the tax rolls or a reduction of tax revenue to the City.
>
> Policy LU-39 University Traffic: Reduce traffic impacts of the University on the citywide transportation system.
>
> Policy LU-40 Public Use of University Facilities and Grounds: Continue to support maximum opportunities for citizen use of campus libraries and recreational facilities, the maintenance of the hill lands as open space, and the adoption of University development standards and policies to conserve and enhance present open space resources.
>
> Policy LU-41 Public Agency Development: Ensure that all land use plans, development, and expansion by public agencies are consistent with City laws, the City's General Plan and Zoning Ordinance to the extent feasible, and the California Environmental Quality Act.

Oakland General Plan

The Land Use and Transportation Element of the Oakland General Plan assigns land within the city to one of 15 land use designations. The General Plan designates a portion of the LBNL site as "Institutional," a designation that is "intended to create, maintain, and enhance areas appropriate for educational facilities, cultural and institutional uses, health services and medical uses as well

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1 Floor area ratio is the ratio of floor area in a building to the land area of the lot on which the building sits.

as other uses of similar character." The maximum building intensity in areas with Institutional designations is a FAR of 8; however, appropriate development standards for areas where the Institutional use is adjacent to sensitive land uses, such as residential uses, are addressed by the City's zoning code. In addition to the "Institutional" designation, a portion of LBNL is also designated as a Resource Conservation Area, where future buildings are not permitted except as required to facilitate the maintenance of conservation areas.

The Oakland General Plan was adopted more recently than the City's zoning regulations; thus, the General Plan and zoning regulations may conflict. When a conflict occurs between zoning regulations and the General Plan, the General Plan takes precedence (City of Oakland, 2001). Specific General Plan policies relating to the LBNL site give priority to the appropriate siting and design of institutional facilities, to minimizing conflicts between residential and nonresidential activities, and to developing regulations and procedures that allow an open, fair, timely, and fully informed permitting and enforcement process for future development.

The Oakland City Council adopted the Land Use and Transportation Element of the Oakland General Plan on March 24, 1998. Slightly over half of the 200-acre LBNL site is within the North Hills area of the City of Oakland. As noted above, LBNL is not subject to local land use regulations and policies, but seeks consistency with local plans and policies where feasible for this portion of the site. Oakland General Plan policies pertaining to the 2006 LRDP are as follows:

> Objective N2: Encourage adequate civic, institutional, and educational facilities located within Oakland, appropriately designed and sited to serve the community.
>
> Policy N2.1 Designing and Maintaining Institutions: As institutional uses are among the most visible activities in the City and can be sources of community pride, high-quality design and upkeep/maintenance should be encouraged. The facilities should be designed and operated in a manner that is sensitive to surrounding residential and other uses.
>
> Policy N2.3 Supporting Institutional Facilities: The City should support many uses occurring in institutional facilities where they are compatible with surrounding activities and where the facility site adequately supports the proposed uses.
>
> Policy N2.8 Long Range Development Planning: Require, where legally allowed, and in all other situations encourage, those institutions designated with the "Institutional" land use classification should be required to present Long Range Operation and Development Plans to the City Planning Commission. While these plans could be binding or non-binding, they should present realistic information regarding the continued operation and/or expansion of the facilities. The City suggests that substantial public input be built into the process of developing the plans. The plans could be required as a part of development applications, or on a periodic basis.

IV.H.3 Impacts and Mitigation Measures

IV.H.3.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines and the UC CEQA Handbook, an impact of the proposed LRDP on land use and planning policies would be considered significant if it would exceed the following Standards of Significance:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- Conflict with any habitat conservation plan or natural community conservation plan; or
- Conflict with local land use regulations such that a significant incompatibility is created with adjacent land uses.

As noted above, LBNL is not subject to local land use regulations and policies. The analysis in this section, therefore, focuses on the compatibility of the proposed LRDP with existing and planned land uses near the site.

IV.H.3.2 Impact Assessment Methodology

The impact analysis compares the net impact of the LRDP to the Standards of Significance and determines the impact's level of significance under CEQA. If the impact would be significant, the analysis identifies mitigation measures that would eliminate the impact or reduce it to a less-than-significant level. If the impact cannot be reduced to a less-than-significant level after implementation of all feasible mitigation measures, then the impact would remain significant and unavoidable. The methodology applied to assess and evaluate land use impacts in this EIR is based on information obtained from the following sources:

- Site reconnaissance;
- Review of published environmental documentation and land use studies published by local jurisdictions addressing land use issues within their jurisdiction; and
- Review of applicable policies of the Berkeley General Plan and the Oakland General Plan.

Before approving any subsequent activity implemented pursuant to the LRDP, the Lab would evaluate whether the land use impacts were examined in this program EIR before finding the activity to be within the scope of the project covered by the program EIR. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3).

IV.H.3.3 2006 LRDP Principles, Strategies, and LBNL Design Guidelines

As described in Chapter III, Project Description, the 2006 LRDP would classify on-site land use into four broad categories that focus on the Lab's research mission and its place in the natural setting of the Oakland-Berkeley hills. Under the land use classification scheme presented in the 2006 LRDP, the majority of the Lab's hill site (approximately 72 percent of the 202-acre site) would be designated as developable area, encompassing developed areas with buildings, roads, parking lots, major infrastructure, and related facilities (see Table III-3 in Chapter III, Project Description). Further development of laboratory, office, and functional support spaces as well as utilities and other associated structures is anticipated under the 2006 LRDP.

The 2006 LRDP divides the open space classification in the 1987 LRDP into two distinct categories. The distinction between the two categories is the degree to which vegetation management is applied. In the Vegetation/Wildland Fire Risk Management Areas (about 27 percent of the hill site), which separate the Lab from adjacent residential properties and the more rural surroundings to the east, vegetation would be regularly managed to reduce the intensity of potential wind-driven fire. In Limited Management Areas (about 2.5 percent of the Lab site), only infrequent management is anticipated. Operations within Limited Management Areas would consist of adjustment of utility lines and monitoring stations, selected control of invasive non-native plants, and removal of fallen trees, as well as removal of ground-level plant material on the outer perimeter of these zones that could allow a wind-driven fire to move into the tree canopy. (See further discussion of vegetation management and fire risk issues in Chapter IV.C, Biological Resources, and Chapter IV.K, Public Services and Recreation.)

2006 LRDP Principles and Strategies

Future development at Berkeley Lab would build upon and strengthen the existing hillside cluster development pattern to create a more campus-like setting that reflects the Lab's unique site and functional needs. The main site would be organized into six "research clusters" defined by major topographic features encompassing research functions that share common needs and interests. One "service cluster" would provide a central location for facilities and shipping/receiving operations.

A network of pedestrian paths would link these clusters to the "Central Commons" area that would serve as the social heart of the Laboratory. The Central Commons and pedestrian pathways would be essential elements of the Laboratory's functional and experiential qualities and are discussed in further detail on the pages that follow.

Most new buildings would be located on infill sites and/or adjacent to existing facilities, resulting in a higher density of development within each cluster, improving operational efficiencies, and creating a more collegial setting. These new facilities would also be planned and designed to segregate vehicular and pedestrian uses. Spaces for vehicular circulation, parking, deliveries, and service activities would be located at the perimeter of each research cluster. Outdoor spaces for pedestrian uses would be located toward the center of these clusters, in spaces formally defined by the edges of new and existing buildings.

The specific configuration and design of new development within these clusters would be guided by illustrative plans and design guidelines prepared by the Laboratory. LBNL Design Guidelines support the objectives of the Laboratory and address the specific design of outdoor spaces and buildings. They are intended to result in an arrangement of facilities that would improve the Laboratory's appearance and functionality, and foster a sense of community and interaction.

The 2006 LRDP proposes four fundamental principles that form the basis for the development strategies provided for each element of the LRDP. All four principles are expressed in the land use plan: "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship"; "build a safe, efficient, cost effective scientific infrastructure capable of long-term support of evolving scientific missions"; "build a more campus-like research environment"; and "improve access and connections to enhance scientific and academic collaboration and interaction."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP (see Chapter III, Project Description, for further discussion, and see Appendix B for a full listing of principles, strategies and design guidelines). Development strategies set forth in the 2006 LRDP applicable to land use include the following:

Land Use Strategies

- Protect and enhance the site's natural and visual resources, including native habitats, streams and mature tree stands by focusing future development primarily within the already developed areas of the site.
- Provide flexibility in the identification of land uses and in the siting of future facilities to accommodate the continually evolving scientific endeavor.
- Configure and consolidate uses to improve operational efficiencies, adjacencies and ease of access.
- Minimize the visibility of Laboratory development from neighboring areas.

Development Framework Strategies

- Increase development densities within the most developed areas of the site to preserve open space, enhance operational efficiencies and improve access.
- To the extent possible site new projects to replace existing outdated facilities and ensure the best use of limited land resources.
- To the extent possible site new projects adjacent to existing development where existing utility and access infrastructure may be utilized.
- Site and design new facilities in accordance with University of California energy efficiency and sustainability policy to reduce energy, water and material consumption and provide improved occupant health, comfort and productivity.
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory.

Vehicle Access, Circulation, and Parking Strategies

- Reduce the percentage of parking spaces relative to the adjusted daily population.
- Consolidate parking into larger lots and/or parking structures, locate these facilities near Laboratory entrances to reduce traffic within the main site.
- Remove parking from areas targeted for outdoor social spaces and service areas.
- Consolidate service functions wherever possible in the Corporation Yard.
- Develop new campus-like outdoor spaces such as plazas within clusters of facilities and improve those that already exist.
- Minimize impervious surfaces to reduce storm water run-off and provide landscape elements and planting to stabilize slopes, reduce erosion and sedimentation.
- Consolidate utility distribution into centralized utility corridors that generally coincide with major roadways.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The document provides the following specific planning and design guidance relevant to land use:

From "A. The Land, Topography and Views":

- Provide screening landscape elements to visually screen large building;
- Mass and site buildings to minimize their visibility;
- Respect View Corridors; and
- Minimize further increases in impermeable surfaces at the Lab.

From "B. Research Clusters":

- Create new Commons Spaces in clusters that currently lack them;
- Create as high a density and critical mass around commons spaces as possible;
- Segregate public entries and paths from service entries and paths where feasible; and
- Develop Research Clusters in a way that is mindful of future expansion.

From "C. Linkages":

- Reduce the amount of impermeable surfaces at the Lab;
- Minimize visual and environmental impacts of new parking lots; and
- Site and design parking structures to integrate with the natural surroundings.

IV.H.3.4 Impacts and Mitigation Measures

Impact LU-1: Implementation of the proposed 2006 LRDP would increase building square footage and adjusted daily population (ADP) at LBNL. Because new construction would be within developed areas and would not introduce substantially new land uses, the 2006 LRDP would not physically divide an established community. (Less than Significant)

The Lab is surrounded by a mix of land uses, including open space, institutional uses, housing, and neighborhood commercial areas, in the cities of Berkeley and Oakland. The Lab is largely buffered by undeveloped University-owned land, although the northwest corner of the Lab is generally adjacent to residential neighborhoods in the city of Berkeley. As described in the Introduction to this EIR, the proposed 2006 LRDP was reduced in scope in response to comments from the City of Berkeley. Consistent with this reduction in scope, occupiable (research and support) building space on the LBNL hill campus would increase by 660,000 square feet, from 1.76 million to 2.42 million square feet. Additionally, the ADP would increase from 3,650 to 4,650 at the hill site. To accommodate this level of growth, a combination of building replacement and new construction[2] is proposed on the hill site. All development would occur within the area designated by the 2006 LRDP as developable area. Consistent with the direction in the LRDP, most new construction (and all renovation of existing buildings) would occur on infill sites and locations adjacent to existing buildings.

Currently, the ratio of the total building area to the total site acreage is approximately 20 percent (a FAR of 0.2), and site coverage by building footprints is approximately 11 percent. With implementation of the 2006 LRDP, the FAR on the hill site would increase to approximately 0.27, while site coverage by buildings would increase to about 17 percent.

Because all new development would occur within the area designated by the 2006 LRDP as developable area, and because most new construction (and all renovation of existing buildings) would occur on infill sites and locations adjacent to existing buildings, LRDP projects would not physically divide adjacent neighborhoods or communities. Furthermore, the 2006 LRDP would maintain the hill site as a scientific research institution, and would not introduce substantially new land uses at the hill site. Based on the foregoing, the 2006 LRDP would not result in a substantial effect on the existing character of the area or surrounding communities, and the impact would be less than significant.

Mitigation: None required.

Project Variant. The project variant proposes an increase in the ADP on the hill site, compared to the proposed LRDP, but does not propose additional building space. Under the project variant, LBNL employees currently working at off-site locations would be relocated to the hill site. The project variant does not propose additional building space on the hill site, nor does the project

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[2] For the purposes of this EIR, the term "construction," unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

variant propose any land uses that would differ from the 2006 LRDP. Therefore, the project variant, similar to the 2006 LRDP, would not physically divide an established community or substantially affect the existing character of the area or surrounding communities.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to land use and planning. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would not physically divide an established community, and the impact of such projects would also be less than significant.

Impact LU-2: Implementation of the proposed 2006 LRDP would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect, nor would the project conflict with local land use regulations such that a significant incompatibility is created with adjacent land uses. (Less than Significant)

The LBNL site is owned by the University of California, which also operates the Lab under a contract with the Department of Energy (DOE); DOE owns most of the facilities and structures within LBNL.[3] LBNL is therefore generally not subject to local policies, plans, or regulations. The University of California and DOE are the agencies with jurisdiction over LBNL projects. Thus, the potential land use impact resulting from the proposed 2006 LRDP with respect to conflicts with applicable land use plans, policies, or regulations of an agency with jurisdiction over the project is considered less than significant.

It is important to note, however, that the LRDP would be consistent with the “Institutional” land use designations for the hill site provided by the Berkeley General Plan and Oakland General Plan. The 2006 LRDP does propose an increase in the density of existing land use on the hill site. Although the future distribution of specific research-related uses could change with implementation of the LRDP, the types of land use at the Lab would not, and the Berkeley Lab would continue to operate as a scientific research institution.

[3] Contract 31 provides for 27,556 square feet of University-owned buildings on the hill, specifically Chemistry Building No. 5 with 4,742 square feet and 22,814 square feet of Building 6 (Advanced Light Source).

Since the 2006 LRDP proposes land use at the hill site that would be similar to existing land uses, the LRDP would not result in any change with respect to compatibility with adjacent uses, either in Berkeley or Oakland.

Since the 2006 LRDP would provide for land uses that are generally consistent with Berkeley and Oakland general plan land use designations and that would not conflict with adjacent land uses, the impact would be less than significant.

The project site is not located within an area with an adopted habitat conservation plan or natural community conservation plan; therefore, the project would not conflict with such plans. The *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay* (USFWS, 2003) that would apply to the LBNL site is discussed in Section IV.C, Biological Resources.

Mitigation: None required.

Project Variant. The project variant proposes an increase in the ADP on the hill site, compared to the proposed LRDP, but does not propose additional building space. Under the project variant, LBNL employees currently working at off-site locations would be relocated to the hill site. Building space currently used by LBNL employees at off-site locations would be vacated, and re-use would be expected to be consistent with the appropriate jurisdiction's general plan and zoning ordinance. The project variant does not propose any land uses that would differ from the 2006 LRDP. Therefore, the project variant, similar to the 2006 LRDP, would result in less-than-significant impacts with regard to plan consistency and land use compatibility.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to land use and planning. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, nor conflict with local land use regulations such that a significant incompatibility is created with adjacent land uses. Therefore, the impacts of such projects in this regard would be less than significant.

IV.H.3.5 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex—housing the Bevatron accelerator—although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Additional projects currently under way at UC Berkeley, described in Section VI.C, Cumulative Impacts, of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis includes Berkeley Lab and areas proximate to the Lab within the cities of Berkeley and Oakland. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.H-6) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact LU-3: The proposed 2006 LRDP, when combined with cumulative growth in the project vicinity, would increase the intensity of existing land uses in the area but would not physically divide an established community, conflict with applicable land use regulations, or cause conflicts with existing uses. (Less than Significant)

Implementation of the 2006 LRDP combined with cumulative growth would not physically divide an established community. The project site is surrounded by open space and residential neighborhoods that are largely built out. Growth at UC Berkeley pursuant to the campus' 2020 LRDP would contribute to cumulative development in Berkeley and the vicinity. [4] However, neither LBNL nor UC Berkeley would grow or expand in such a way that the fundamental nature of the institutions or their relationship with surrounding communities would be altered; therefore, the cumulative impact would be less than significant.

Development under the 2006 LRDP would intensify existing land use on the LBNL hill site, but would not substantially affect the broader study area, because LRDP development projects would occur within the existing LBNL site borders, with potential minor modifications, e.g., environmental monitoring stations, utility connections, and small research structures on other Regents-owned lands. On-site changes could include the conversion of undeveloped land to infill development, replacement of certain research-related uses with other uses, an increase in intensity of use, or changes from one land use to another. Although land use distribution by specific research-related use could change at LBNL, in general future uses would be consistent with the existing uses.

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[4] The EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) found that those projects would not result in any adverse land use impacts, and thus the SCIP would not contribute to any cumulative impacts (UC Berkeley, 2006).

LBNL leases off-site space in Berkeley, Oakland, Walnut Creek, and Washington D.C., the amount of which is not expected to substantially increase, on average, during the 2006 LRDP planning period. However, this amount could periodically be higher or lower than current levels, depending on future Lab needs and market conditions. Private development on non-University-owned land leased by LBNL would be subject to separate environmental review and would be subject to municipal general plans, zoning regulations, and design review, thus ensuring consistency of such projects with local regulations. Therefore, implementation of the 2006 LRDP, together with the cumulative impacts of regional growth, would not conflict with local land use regulations such that an incompatibility would occur among local land uses, and the project would not result in a cumulatively considerable effect.

Mitigation: None required.

Project Variant. The project variant would result in land use and planning impacts substantially similar to the land use and planning impacts that would result from the 2006 LRDP development. The cumulative land use and planning impacts of the project variant would therefore be less than significant as described above.

Individual Future Project/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. A potential future project under the LRDP such as those identified in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development as discussed above, would also, for the reasons stated above, result in cumulative land use and planning impacts that would be less than significant.

IV.H.4 References – Land Use and Planning

City of Berkeley, Berkeley General Plan, Land Use Element, 2002.

City of Berkeley, Berkeley General Plan EIR, 2001.

City of Oakland, Community and Economic Development Agency. *Guidelines for Determining Project Conformity with the General Plan and Zoning Regulations.* December 5, 2001.

City of Oakland, Oakland General Plan Land Use and Transportation Element, 1998.

U.S. Fish and Wildlife Service (USFWS), *Draft Recovery Plan for Chaparral Species in Northern California*, April 7, 2003. http://sacramento.fws.gov/ea/News_Releases/Chaparral_Recovery_NOA.htm, viewed December 8, 2003.

UC (University of California) Berkeley, *Southeast Campus Integrated Projects Tiered Focused Final Environmental Impact Report (SCH #2005112056)*; October 31, 2006. Available on the internet at http://www.cp.berkeley.edu/SCIP/FEIR/SCIP_FEIR.html.

IV.I. Noise

IV.I.1 Introduction

This chapter evaluates the potential noise impacts of the proposed 2025 Long Range Development Plan (LRDP) for the Lawrence Berkeley National Laboratory (LBNL). This section discusses the existing noise environment at and around the LBNL site and the regulatory framework for regulation of noise, and analyzes the potential for the project to affect the existing ambient noise environment during construction, demolition, and operational activities. Although LBNL is exempt, the EIR analyzes the consistency and potential conflicts of the LRDP with relevant local agency noise policies and regulations. The analysis in this section is based on a review of existing documentation for the project site, a noise monitoring survey conducted by ESA, the general plans for the cities of Berkeley and Oakland, the EIR for the Berkeley General Plan, and the *University of California CEQA Handbook* prepared by the UC Office of the President.

IV.I.2 Setting

IV.I.2.1 Technical Background

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Because sound pressure can vary by over one trillion times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear’s decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA).[1] Frequency A-weighting

1 All noise levels reported herein reflect A-weighted decibels unless otherwise stated.

follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. However, noise levels rarely persist consistently over a long period of time. Rather, community noise varies continuously with time with respect to the contributing sound sources. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized as follows:

L_{eq}: The equivalent sound level, which is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level measured during the measurement period of interest.

L_{min}: The instantaneous minimum noise level measured during the measurement period of interest.

L_x: The sound level that is equaled or exceeded x percent of a specified time period. The L_{50} represents the median sound level (i.e., the noise level exceeded 50 percent of the time).

DNL: The energy average of the A-weighted sound levels occurring during a 24-hour period, accounting for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted by adding 10 dBA to take into account the greater annoyance of nighttime noises.

CNEL: The Community Noise Equivalent Level, which, similar to the DNL, adds a 5-dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

Effects of Noise on People

The effects of noise on people can be placed into three categories:

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants generally experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting human reaction to a new or changed noise environment is the way the noise levels compare to the existing environment to which one has adapted: the so-called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;

- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;

- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and

- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence, the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 7.5 dBA per doubling of distance from the source, depending on the topography of the area and environmental conditions (e.g., atmospheric conditions, noise barriers [either vegetative or manufactured]). Thus, a noise measured at 90 dBA 50 feet from the source would be about 84 dBA at 100 feet, 78 dBA at 200 feet, 72 dBA at 400 feet, and so forth. Widely distributed noise, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate, approximately 4 to 6 dBA per doubling of distance from the source.

IV.I.2.2 Local Plans and Policies

LBNL is a federal facility managed and operated by the University of California under a U.S. DOE-UC contract. The research, service and training work is within the University's mission and the land is owned by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies contained in both the Berkeley and Oakland general plans, as well as the most relevant City of Berkeley and City of Oakland ordinances relevant to noise impacts at LBNL.

City of Berkeley

The City of Berkeley's General Plan Environmental Management Element contains guidelines for determining the compatibility of various land uses with different noise environments. Generally, the noise level for residential, hotel and motel uses is 60 dBA or less, while conditionally acceptable noise levels range from over 60 dBA to 75 dBA (may require insulation, etc.). Noise levels over 75 dBA are, in general, unacceptable. The City of Berkeley's Community Noise Ordinance sets limits for permissible noise levels during the day and night according to the zoning of the area. If ambient noise exceeds the standard, the ambient noise level becomes the allowable noise level. Areas adjacent to the southwestern portion of LBNL are zoned R-1H, R-2AH, and R-3H.[2] Table IV.I-1 presents the maximum allowable receiving noise standards for residential land uses.

TABLE IV.I-1
CITY OF BERKELEY
MAXIMUM ALLOWABLE RECEIVING NOISE STANDARDS[a] FOR RESIDENTIAL LAND USES, DBA

Residential Zoning District	Daytime 7:00 a.m. To 10:00 p.m.	Nighttime 10:00 p.m. To 7:00 a.m.
R-1, R-2	55	45
R-3	60	55

[a] Noise level not to be exceeded by more than thirty minutes any hour

SOURCE: Berkeley Noise Ordinance

[2] "H" is a Hillside overlay district designed to protect views and the character of Berkeley's hills, and allows modification of lot sizes and building heights when justified by steep topography, irregular lot size, etc. R-2A districts permit small multiple-family and garden-type apartment structures consistent with adjacent areas and with a maximum of open space.

For construction/demolition noise, with certain exceptions, the Noise Ordinance (Sec. 13.40.070 of the Municipal Code) prohibits operating tools and equipment used in these activities between 7:00 p.m. and 7:00 a.m. on weekdays and 8:00 p.m. and 9:00 a.m. on weekends or holidays such that the sound creates a noise disturbance across a residential or commercial real property line. The Noise Ordinance states that, "where technically and economically feasible," maximum weekday construction noise levels must be controlled so as not to exceed 75 dBA at the nearest properties for mobile equipment ("nonscheduled, intermittent, short-term operation (less than 10 days)") and 60 dBA at the nearest properties for stationary equipment ("repetitively scheduled and relatively long-term operation (periods of 10 days or more)"), in R-1 and R-2 zoning districts; in the R-3 district, the permitted noise levels are 5 dBA higher. The noise standards are more restrictive on weekends, by 10 dBA for stationary equipment and 15 dBA for mobile equipment.

Berkeley General Plan policies pertaining to noise that are relevant to implementation of the LBNL LRDP include the following:

> Environmental Management Objective 8: Protect the community from excessive noise levels.
>
> Policy EM-43 Noise Reduction: Reduce significant noise levels and minimize new sources of noise.
>
> Policy EM-44 Noise Prevention and Elimination: Protect public health and welfare by eliminating existing noise problems where feasible and by preventing significant future degradation of the acoustic environment.
>
> Policy EM-45 Traffic Noise: Work with local and regional agencies to reduce local and regional traffic, which is the single largest source of unacceptable noise in the city.
>
> Policy EM-46 Noise Mitigation; Require operational limitations and all feasible noise buffering for new uses that generate significant noise impacts near residential, institutional, or recreational uses.
>
> Policy EM-47 Land Use Compatibility: Ensure that noise-sensitive uses, including, but not limited to, residences, child-care centers, hospitals and nursing homes, are protected from detrimental noise levels.

City of Oakland

The Oakland General Plan contains guidelines for determining the compatibility of various land uses with different noise environments. The Noise Element recognizes that some land uses are more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Present and proposed uses are consistent with the City of Oakland's General Plan designation of institutional use and resource conservation.

The City of Oakland also regulates short-term noise through city ordinances, which include a general provision against nuisance noise sources (Planning Code, Section 17.120). The factors that are considered when determining whether the ordinance is violated include a) the level, intensity, character, and duration of the noise; b) the level, intensity, and character of the background noise; and c) the time when, and the place and zoning district where, the noise occurred. Table IV.I-2 presents the maximum allowable receiving noise standards for land uses in Oakland. With the maximum construction noise expected to be associated with the project, noise levels at the property line of the nearest residences would not exceed the City standards.

TABLE IV.I-2
CITY OF OAKLAND
MAXIMUM ALLOWABLE RECEIVING NOISE STANDARDS, DBA

	Residential and Civic Uses[a]		Commercial Uses
Cumulative Number of Minutes in Either the Daytime or Nighttime One Hour Period[b]	Daytime 7:00 a.m. to 10:00 p.m.	Nighttime 10:00 p.m. to 7:00 a.m.	Day or Night
20	60	45	65
10	65	50	70
5	70	55	75
1	75	60	80
0	80	65	85

[a] Legal residences, schools and childcare facilities, health care and nursing homes, public open space, or similarly sensitive land uses.
[b] The concept of "20 minutes in an hour" is equivalent to the $L_{33.3}$, which is a noise descriptor identifying the noise level exceeded one-third (33.3 percent) of the time. Likewise, "10 minutes in an hour," "5 minutes in an hour," and "1 minute in an hour" are equivalent to the $L_{16.7}$, $L_{8.3}$, and $L_{1.7}$, respectively. L_{max}, or maximum noise level, represents the standard defined in terms of "0 minutes in an hour."

SOURCE: Oakland Planning Code Sec. 17.120.050

The Oakland Noise Ordinance (Oakland Planning Code Sec. 17.120.050) specifies that, for residential receptors, the maximum allowable receiving noise for weekday (Monday through Friday, 7:00 a.m. to 7:00 p.m.) construction activity of greater than 10 days in duration is 65 dBA, while on weekends (9:00 a.m. to 8:00 p.m.), the maximum allowable receiving noise for long-term construction is 55 dBA. For commercial and industrial receptors, the maximum allowable receiving noise for construction activity greater than 10 days is 70 dBA on weekdays and 60 dBA on weekends. For construction activity of 10 days or less, the residential receiving standard is 80 dBA on weekdays and 65 dBA on weekends, while the commercial/industrial standards are 85 dBA on weekdays and 70 dBA on weekends. Nighttime construction is subject to the nighttime noise standards in Table IV.I-2.

IV.I.2.3 Existing Noise Environment

Within the boundaries of LBNL, the ambient noise environment is generated by vehicular traffic on the roadway network (particularly the shuttle buses), heating, ventilating, and air-conditioning equipment associated with buildings and other stationary equipment at the Lab including pumps, generators, cooling towers, exhaust hoods, and machine shop equipment. Construction projects have been undertaken continuously on the LBNL site over the past few years. Therefore the noise environment in the immediate vicinity of these construction sites is dominated by the activity of construction equipment and service vehicles. However, most of the noise generated by the on-site stationary sources and construction equipment attenuates to levels that are not noticeable above the ambient noise environment at the nearby receptors.

A noise monitoring survey was conducted to document existing noise levels at various locations in and around the LBNL site. Short-term measurements (ranging from 5 to 15 minutes) were taken using a Metrosonics dB-108 noise meter. The results are presented in Table IV.I-3. The noise monitoring locations are shown in Figure IV.I-1.

TABLE IV.I-3
MEASURED NOISE LEVELS ON OR WITHIN THE VICINITY OF THE PROJECT AREA

Site No.[b]	Measurement Location	Noise Level in dBA[a]			
		L_{eq}	L_{max}	L_{10}	L_{90}
Based on 15-Minute Noise Measurement Data					
1	299 Panoramic Way	46	53	NM	NM
2	Foothill Parking Lot	57	67	58	49
3	Tibetan Nyingma Institute (n. side)	48	57	49	46
4	LBNL Building 76	68	81	68	64
5	LBNL Building 85	53	72	51	46
6	LBNL Building 74	64	81	63	59
7	LBNL Buildings 62 and 63	54	71	53	45
8	LBNL Buildings 6 and 7	58	68	60	54
9	LBNL Building 71	60	74	62	46
10	LBNL Buildings 56 and 61	52	61	54	49
11	LBNL Building 65	66	83	70	48
12	LBNL Building 70A	58	73	59	50
13[c]	End of Canyon Road	58	68	60	53
14[c]	Hearst Avenue at Highland Place	64	80	55	57

a L_{eq} = equivalent steady-state noise level over a one-hour period produced by the same noise energy as the variable noise levels during that period; L_{max} = instantaneous maximum noise level; L_{10} = noise level exceeded 10 percent of the time; L_{90} = noise level exceeded 90 percent of the time.
b Measurement locations correspond to those shown in Figure IV.I-1.
c Noise measurement reported in UC Berkeley LRDP EIR, Table 4.9-3.

NM – Not Measured

SOURCE: Environmental Science Associates, 2003 and 2004; UC Berkeley, 2004.

IV.I.2.4 Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others are, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise than are commercial and industrial land uses.

Sensitive land uses surrounding the project site include residences, open space areas, and student dormitories. LBNL does not immediately border residential areas, except along its western and northern boundary near Cyclotron Road. North of the central portion of LBNL, located on the slopes above LBNL, are the Lawrence Hall of Science, the Space Sciences Laboratory, and the

SOURCE: Lawrence Berkeley National Laboratory; ESA (2003, 2004); UC Berkeley (2004)

Figure IV.I-1
Noise Measurement Locations

Mathematical Sciences Research Institute. These buildings and the adjacent property are owned by the University of California. Also to the north and northwest of LBNL are residential neighborhoods and a neighborhood commercial area within the City of Berkeley.

There are several vibration-sensitive laboratories and scientific instruments at the LBNL main site. Potential vibration effects on these laboratories and instruments are managed through internal communication and project coordination and are thus not a subject in this EIR. This coordination would continue under the proposed 2006 LDRP.

IV.I.3 Impacts and Mitigation Measures

IV.I.3.1 Significance Criteria

The impact of the proposed LRDP on the ambient noise environment would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the CEQA Guidelines and the UC CEQA Handbook:

- Expose people to or generate noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies;
- Expose people to or generate excessive ground-borne vibration or ground-borne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in exposure of people residing or working in the project area to excessive noise levels if the project is located within an area covered by an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport; or
- Result in exposure of people residing or working in the project area to excessive noise levels if the project is located in the vicinity of a private airstrip.

Berkeley Lab is not within an area covered by an airport land use plan, nor is it within the vicinity of a private airstrip. Therefore, the last two criteria are not addressed further in this section.

To assess whether the development under the proposed LRDP would expose persons to or generate noise levels that are excessively high, the EIR evaluates the absolute change in noise levels due to the project and the relationship between the resultant noise level and the noise/land use compatibility guidelines of the Governor’s Office of Planning and Research (OPR, 1998) OPR has developed specific planning guidelines for noise/land use compatibility, which are shown in Table IV.I-4. These standards form the basis of the noise/land use compatibility guidelines adopted by the cities of Berkeley and Oakland in the noise elements of their general plans.

For low-density residential uses, normally acceptable exterior noise levels are those below 60 dBA DNL or CNEL. For multi-family residences, normally acceptable exterior noise levels are those below 65 dBA DNL or CNEL. Campus support housing falls into the category of multi-family housing (medium- to high-density) and therefore is subject to the 65-dBA acceptability level for normally acceptable noise levels. Offices, laboratories, and academic buildings on the LBNL site would be subject to the 70-dBA acceptability level for normally acceptable noise levels, which is the same threshold for schools and office buildings.

For the purposes of this EIR, noise impacts would be considered significant if the project resulted in the following DNL levels at locations that affect human receptors:

- An increase of 3 dBA DNL where the noise levels without the project are above the OPR standards for “normally acceptable” noise levels; or

- An increase of 5 dBA DNL, where the noise levels without the project are 50 to 65 dBA DNL for residential uses and the increase in noise from the project does not cause the OPR standards to be exceeded.

It should be noted that a noise increase of 3 decibels is generally regarded as the minimum perceptible increase and has been used as a standard in this EIR to evaluate impacts in areas where the ambient or background noise levels without the project are close to or exceed the OPR noise/land use compatibility standard for affected land uses. Increases of 5 and 10 decibels have been used as a standard in areas where the ambient or background noise levels without the project are low or moderate. The use of this “sliding scale” is appropriate because where ambient/background levels are low, an increase over 3 decibels would be perceptible but would not cause annoyance or activity interference. In contrast, if the ambient/background noise levels are high (above 65 dBA in multi-family residential areas), any perceptible increase could cause an increase in annoyance.

The standards described above have been used to assess the significance of any long-term increases in noise generated by the project. Long-term increases are associated with campus operations and campus-related traffic.

Construction- and demolition-related noise associated with the implementation of the LRDP is analyzed to assess whether the LRDP would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without implementation of the LRDP. The criterion noise level for determining the impact significance of such noise on sensitive receptors varies according to the time of day, as noted in the discussion of the Berkeley and Oakland noise ordinances, beginning on p. IV.I-4. Construction/demolition noise is considered a significant impact if it would result in violations of noise ordinance standards of the cities of Berkeley or Oakland (as applicable, depending on the location of off-site receptors).

TABLE IV.I-4
ACCEPTABLE EXTERIOR NOISE LEVELS FOR LAND USE CATEGORIES

Land Use Category	Levels of Acceptability[a], DNL[b] or CNEL[c](dBA)[d]			
	Normally Acceptable	**Conditionally Acceptable**	**Normally Unacceptable**	**Clearly Unacceptable**
Residential –Low Density Single Family, Duplex, Mobile Homes	Less than 60	55 to 70	70 to 75	More than 75
Residential –Multi Family	Less than 65	60 to 70	70 to 75	More than 75
Transient Lodging – Motels, Hotels	Less than 65	60 to 70	70 to 80	More than 80
Schools, Libraries, Churches, Hospitals, Nursing Homes	Less than 70	60 to 70	70 to 80	More than 80
Auditoriums, Concert Halls, Amphitheaters	–	Less than 70	–	More than 65
Sports Arena, Outdoor Spectator Sports	–	Less than 75	–	More than 70
Playgrounds, Neighborhood Parks	Less than 70	–	67 to 75	More than 73
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Less than 75	–	70 to 80	More than 80
Office Buildings, Business Commercial and Professional	Less than 70	68 to 73	More than 75	–
Industrial, Manufacturing, Utilities, Agriculture	Less than 75	70 to 80	More than 75	–

[a] Levels of Acceptability are defined as follows:

Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Normally Unacceptable: New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable: New construction or development clearly should not be undertaken.

[b] Day-Night Level (DNL) is a descriptor of the community noise environment that represents the energy average of the A-weighted sound levels occurring during a 24-hour period, and that accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night (“penalizing” nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.

[c] Community Noise Equivalent Level (CNEL) is the average A-weighted noise level during a 24-hour day, obtained by addition of five decibels in the evening from 7:00 to 10:00 p.m., and an addition of a ten-decibel penalty in the night between 10:00 p.m. and 7:00 a.m.

[d] A definition of decibels and A-weighted decibels (dBA) is provided under “Technical Background” in this section.

SOURCE: Governor’s Office of Planning and Research, *General Plan Guidelines*, Appendix A: Guidelines for the Preparation and Content of the Noise Element of the General Plan, 1998.

IV.I.3.2 Impact Methodology

The impact analysis compares the net impact to the standards of significance stated above and determines the impact's level of significance under CEQA. If the impact would be a significant impact, the analysis identifies mitigation measures that would eliminate the impact or reduce it to a less-than-significant level. If the impact cannot be reduced to a less-than-significant level, then the impact would remain significant and unavoidable after implementation of all feasible mitigation measures.

The methodology applied to assess and evaluate land use impacts in the EIR is based on information obtained from site reconnaissance and review of published environmental documentation and land use studies of the Berkeley Lab, including documents published by local jurisdictions addressing land use issues within their jurisdiction.

In addition to providing the environmental impact analysis for the LRDP, the analysis in this EIR will be used in connection with later approvals of specific activities pursuant to the LRDP. The Lab will evaluate the impacts on noise of any later activity implemented pursuant to the LRDP and compare those impacts with the evaluation in this program EIR to determine the appropriate level of any further CEQA documentation that may be required prior to the approval of the later activity. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3).

IV.I.3.3 2006 LRDP Principles, Strategies and LBNL Design Guidelines

2006 LRDP Principles and Strategies

The 2006 LRDP proposes four fundamental principles that form the basis for the Plan's development strategies provided for each element of the Plan. The one principle most applicable to noise is to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP. (See *Chapter III, Project Description* for further discussion, and see Appendix B for a full listing of principles, strategies and design guidelines.) Development Strategies set forth in the 2006 LRDP applicable to noise include the following:

- Protect and enhance the site's natural and visual resources, including native habitats, streams and mature tree stands by focusing future development primarily within the already developed areas of the site;

- Increase development densities within the most developed areas of the site to preserve open space, enhance operational efficiencies and access;
- Site and design new facilities in accordance with University of California energy efficiency and sustainability policy to reduce energy, water and material consumption and provide improved occupant health, comfort and productivity;
- Preserve and enhance the native rustic landscape and protect sensitive habitats;
- Develop new campus-like outdoor spaces such as plazas within clusters of facilities and improve those that already exist; and
- Maintain and enhance tree stands to reduce the visibility of Laboratory buildings from significant public areas in neighboring communities.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab, following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the Plan's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provides the following specific planning and design guidance relevant to noise to achieve these design objectives:

- Provide screening landscape elements to visually screen large buildings;
- Minimize impacts of Disturbed Slopes;
- Mass and site buildings to minimize their visibility;
- Screen Roofscapes;
- Create as high a density and critical mass around commons spaces as possible; and
- Minimize visual and environmental impacts of new parking lots.

IV.I.3.4 Impacts and Mitigation Measures

Impact NOISE-1: Development under the proposed LRDP would result in temporary noise impacts related to construction and demolition activities. (Significant and Unavoidable)

Construction/demolition[3] activities would occur intermittently at different sites in the LBNL campus throughout the period of implementation of the proposed LRDP. Although the related impacts at any one location would be temporary, construction of individual projects under the proposed project could cause adverse effects on the ambient noise environment within the planning area. Noise from construction/demolition activities would result primarily from the operation of equipment. Construction preparation activities such as excavation, grading, earth

[3] For the purposes of this EIR, the term "construction," unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

movement, stockpiling, and batch-dropping operations generate noise. Construction activities such as foundation laying, building construction, and finishing operations would also generate noise. Construction-related noise levels at and near the project site would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Table IV.I-5 shows typical noise levels during different construction stages.

TABLE IV.I-5
TYPICAL CONSTRUCTION NOISE LEVELS

Construction Activity	Noise Level (L_{eq})[a]
Ground Clearing	84
Excavation	89
Foundations	78
Erection	85
Finishing	89

[a] Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

SOURCE: U.S. Environmental Protection Agency, *Noise from Construction Equipment and Building Operations, Building Equipment, and Home Appliances*, December 1971.

Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. In addition, impulsive noises generated by certain types of construction equipment (such as earth compactors and pile driving) can be particularly annoying. Table IV.I-6 shows typical noise levels produced by various types of construction equipment. Standard demolition activities employ equipment similar to that used for construction activities and would have similar, but shorter duration, noise impacts.

TABLE IV.I-6
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA at 50 feet)
Dump Truck	88
Portable Air Compressor	81
Concrete Mixer (Truck)	85
Jack Hammer	88
Scraper	88
Dozer	87
Paver	89
Generator	76
Pile Driver	101
Rock Drill	98
Pump	76
Pneumatic Tools	85
Backhoe	85

SOURCE: Cunnif, Environmental Noise Pollution, 1977.

Construction/demolition activities would generate noise corresponding to the appropriate phase of, and the noise-generating equipment used during, those phases. Depending on the proximity of construction/demolition activities to sensitive receptors, the presence of intervening barriers, and the number, types and duration of equipment used, sensitive receptors could be exposed to significantly high noise levels. Noise levels could be greater than existing noise levels at nearby sensitive receptor locations and could increase day-night levels in close proximity to the construction site by greater than 5 DNL. These temporary increases in noise levels would occur intermittently at various locations in the project area throughout the life of the project. However, most construction/demolition activities undertaken at LBNL pursuant to the 2006 LRDP would occur at some distance from sensitive receptors. For example, the Lab has in recent years assumed jurisdictional control over a band of undeveloped land approximately 500 feet wide, on average, from the horseshoe curve of Cyclotron Road on the west, across the Berkeley-Oakland border to the curve of Lee Road around the southern edge of Building 62. Only in the Lab's northwest corner are Lab buildings and development sites located closer to potential receptors.

LBNL has infrequently (twice in the last 15 years) employed pile driving in construction projects. Alternate methods of drilled piers are more appropriate for most Berkeley Lab locations, and pile driving is not considered likely for subsequent projects under the LRDP.

As noted in the Setting, noise generally attenuates (decreases) at a rate of 6 to 7.5 dBA per doubling of distance. Conservatively assuming an attenuation of 6 dBA per doubling of distance,[4] noise during the noisiest phases of construction/demolition activity (89 L_{eq} at 50 feet) would generate noise levels of approximately 67 L_{eq} if the nearest sensitive off-site receptors were located 600 feet away.[5] In many cases, sensitive receptors are much farther away from locations on the LBNL hill site; in such instances, noise levels at the nearest receptors would be lower.

Depending on the locations of future development projects undertaken pursuant to the 2006 LRDP, construction/demolition noise levels could exceed the City of Berkeley's maximum allowable receiving noise standard of 60 to 65 dBA (depending on the residential zone where noise is heard) for stationary equipment (i.e., construction/demolition equipment that is operated over a period of 10 days or more). However, implementation of Mitigation Measure NOISE-1 would normally reduce such noise to a less-than-significant level.

4 The 6 dBA attenuation with every doubling of distance assumes only geometric spreading of the sound waves and does not take into account other factors such as topography, atmospheric absorption and reflection, etc. Because of the hilly terrain at LBNL, topography plays an important role in attenuating noise as there may be no line of sight between specific locations on the LBNL hill site and the nearest sensitive receptor to that site. Previous noise testing conducted by ESA to determine site-specific attenuation factors has revealed that the attenuation factor may be nearly twice the 6 dBA per doubling of distance from the source. However, because the measurements could be influenced by variation in topography and by buildings and other structures that sometimes attenuate noise, the measured attenuation is valid only for the specific locations evaluated. The published value of 6 dBA per doubling of distance is a widely accepted standard and would make the analysis more conservative. Therefore, an attenuation rate of 6 dBA was used in the evaluation of significance of project impacts.

5 Building S-1 on the Illustrative Development Scenario is analyzed to be constructed approximately 600 feet from the nearest sensitive receptors. The analysis positions the building just inside the main Blackberry Canyon Gate; many other development projects to be undertaken pursuant to the 2006 LRDP, such as development in the Old Town area adjacent to the Advanced Light Source (Building 6) and redevelopment of the Bevatron (Building 51), would be considerably farther from off-site receptors.

Noise impacts due to the demolition of Building 51 would be less than significant, as well. Based on the analysis in the Building 51 Draft EIR (LBNL, 2005), in which noise tests and calculations were conducted to measure sound propagation from Building 51 to the nearest sensitive receptor areas, demolition-related noise levels at the nearest sensitive receptors would be well below the Berkeley Noise Ordinance limits applicable to construction/demolition operations at all of these locations, and inaudible at most of them. The tests used an artificial noise source producing a noise level of 95 dBA at 50 feet. This artificial noise source served as a surrogate for noise levels associated with the loudest stage of demolition activities. Moreover, as part of project contract specifications, LBNL would require its subcontractors to employ noise control procedures. Therefore, it was concluded that demolition of Building 51 would not result in significant impacts due to noise.

Mitigation Measure NOISE-1a: To reduce daytime noise impacts due to construction/demolition, LBNL shall require construction/demolition contractors to implement noise reduction measures appropriate for the project being undertaken. Measures that might be implemented could include, but not be limited to, the following:

- Construction/demolition activities would be limited to a schedule that minimizes disruption to uses surrounding the project site as much as possible. Such activities would be limited to the hours designated in the Berkeley and/or Oakland noise ordinance(s), as applicable to the location of the project. This would eliminate or substantially reduce noise impacts during the more noise-sensitive nighttime hours and on days when construction noise might be more disturbing.

- To the maximum extent feasible, equipment and trucks used for project construction shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).

- Stationary noise sources shall be located as far from adjacent receptors as possible.

- At locations where noise may affect neighboring residential uses, LBNL will develop a comprehensive construction noise control specification to implement construction/demolition noise controls, such as noise attenuation barriers, siting of construction laydown and vehicle staging areas, and community outreach, as appropriate to specific projects. The specification will include such information as general provisions, definitions, submittal requirements, construction limitations, requirements for noise and vibration monitoring and control plans, noise control materials and methods. This document will be modified as appropriate for a particular construction project and included within the construction specification.

Mitigation Measure NOISE-1b: For each subsequent project pursuant to the LRDP that would involve construction and/or demolition activities, LBNL shall engage a qualified noise consultant to determine whether, based on the location of the site and the activities proposed, construction/demolition noise levels could approach the property-line receiving noise standards of the cities of Berkeley or Oakland (as applicable). If the consultant determines that the standards would not be exceeded, no further mitigation is required. If the standards would be reached or exceeded absent further mitigation, one or more of the following additional measures would be required, as determined necessary by the noise consultant.

- Stationary noise sources shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or other measures to the extent feasible.

- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever feasible.

- Noise from idling trucks shall be kept to a minimum. No trucks shall be permitted to idle for more than 10 minutes if waiting within 100 feet of a residential area.

- If determined necessary by the noise consultant, a set of site-specific noise attenuation measures shall be developed before construction begins; possible measures might include erection of temporary noise barriers around the construction site, use of noise control blankets on structures being erected to reduce noise emission from the site, evaluation of the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings, and monitoring the effectiveness of noise attenuation measures by taking noise measurements.

- If determined necessary by the noise consultant, at least two weeks prior to the start of excavation, LBNL or its contractor shall provide written notification to all neighbors within 500 feet of the construction site. The notification shall indicate the estimated duration and completion date of the construction, construction hours, and necessary contact information for potential complaints about construction noise (i.e., name, telephone number, and address of party responsible for construction). The notice shall indicate that noise complaints resulting from construction can be directed to the contact person identified in the notice. The name and phone number of the contact person also shall be posted outside the LBNL boundaries.

Although in most instances, it can reasonably be anticipated that construction noise impacts on off-site receptors would be reduced to a less-than-significant level through implementation of the above mitigation measures, there may be individual construction and/or demolition projects undertaken during the life of the 2006 LRDP that result in noise impacts that could not be fully mitigated. For example, for future projects undertaken in specific locations near the Lab fence line, if construction activities were determined to be “repetitively scheduled and relatively long-term operations” of 10 days or more of stationary equipment, such activities could exceed the Berkeley Noise Ordinance limits within approximately 1,000 to 1,500 feet of a single-family residence, 500 to 1,000 feet from a multi-family residence, and 500 feet of a commercial/industrial land use. Given no other attenuating factors, where these circumstances are met construction-generated noise from stationary equipment would be expected to exceed limits set forth in local noise ordinances.

Given the above, and for purposes of a conservative analysis, the impact of construction noise is considered to be significant and unavoidable.

Significance after Mitigation: Significant and unavoidable.

Project Variant. The project variant would result in substantially the same construction and demolition noise impacts as the 2006 LRDP. While the project variant would include implementation of Mitigation Measure NOISE-1, the impact would, for the reasons stated regarding implementation of the LRDP, remain significant and unavoidable.

Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of construction noise impacts. For the reasons stated above, potential individual projects under the LRDP such as identified in the Illustrative Development Scenario could result in temporary noise impacts related to construction and/or demolitions activities. Individual projects under the LRDP such as those identified in the scenario would include implementation of Mitigation Measure NOISE -1. In most instances it can be anticipated that implementation of this mitigation measure would reduce construction noise impacts of potential individual projects on off-site receptors to a less-than-significant level, for the reasons stated above. As stated above, however, some potential future projects could exceed local noise standards, such as some projects located near the Lab fence line. For such projects, the impact would remain significant and unavoidable.

Impact NOISE-2: Development under the proposed LRDP would result in temporary vibration impacts related to construction activities. (Less than Significant)

Construction activities can cause vibration that varies in intensity depending on several factors. Of all construction activities, use of pile driving and vibratory compaction equipment typically generate high ground-borne vibration levels.

Construction-induced vibration attenuates more or less rapidly at distance from the source, depending on soil conditions. Perceptible vibrations from impact pile driving can occur at distances of up to approximately 500 feet. As mentioned above, pile driving is not considered likely for subsequent projects under the LRDP. Furthermore, the distance to off-site residential receptors from most potential construction sites is greater than 1,000 feet. If pile driving were to be employed, a CEQA analysis separate from this LRDP EIR would be performed to assess vibration impacts. Vibration impacts from other construction equipment would be considerably less substantial than those from pile driving. Because pile driving is not likely, and because of the distance from potential construction projects at Berkeley Lab to off-site receptors, construction-generated vibration would be attenuated such that there would be no discernible impact.

Mitigation: None required.

Project Variant. The project variant would result in substantially the same noise impacts as the 2006 LRDP. Thus, the vibration impact would be less than significant.

Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of noise impacts. Potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario could result in temporary vibration impacts. Construction-generated vibration would be assessed in a separate CEQA analysis if pile driving were to be employed, which is unlikely. For the reasons stated above regarding implementation of the LRDP as a whole, other construction-generated vibration associated with a specific project identified in the Illustrative Development Scenario would be attenuated such that there would be no discernible vibration, and thus the noise impact would be less than significant.

Impact NOISE-3: Project-generated vehicle traffic associated with the proposed LRDP would result in an incremental, and likely imperceptible, long-term increase in ambient noise levels. (Less than Significant)

Development pursuant to the 2006 LRDP would add, at most, 9 percent to the volume of any of the intersections evaluated in the transportation analysis of this EIR, and these greatest increases would occur only at the intersections in closest proximity to the Lab’s entrance gates. For example, at Hearst and LeRoy Avenues, leading to Cyclotron Road and the Lab’s main Blackberry Canyon Gate, project traffic would add 7.9 percent to projected future volumes in the p.m. peak hour, and 8.6 percent to (slightly lower) projected future volumes in the a.m. peak hour. The increased traffic volumes would not be sufficient to generate perceptible increases in traffic noise. At more heavily traveled intersections, such as Hearst and Oxford Avenues, the project’s increment would be far less – approximately 2 percent. Although the total volumes would be greater at these intersections, traffic generated by LRDP development would result in even less of an increase in noise and, again, the increase would not be perceptible.

Compared to existing traffic volumes, future volumes – including LRDP traffic and traffic generated by cumulative development, including implementation of the UC Berkeley 2020 LRDP – would manifest a much greater increase than that resulting from Berkeley Lab’s LRDP development alone. For example, at the above-noted Hearst/LeRoy intersection, traffic volumes are forecast to increase a total of nearly 40 percent between current conditions and Year 2025 conditions, while at Hearst/Oxford, the increase is forecast to be 25 to 30 percent. Even so, these changes in volumes would barely register in terms of perceptible increases in traffic noise, because it is normally necessary for traffic volumes to double to generate a barely perceptible increase in noise of 3 decibels. Therefore, increases in traffic noise would not be significant.

Mitigation: None required.

Project Variant. The project variant would result in substantially the same noise impacts as the 2006 LRDP. Thus, the traffic noise impact would be less than significant.

Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of noise impacts. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would result in an incremental but likely imperceptible long-term increase in ambient noise levels and any increase in traffic noise would not be significant. Thus the resulting noise impact would be less than significant.

Impact NOISE-4: Continued operation of the LBNL hill site facility would result in a long-term increase in ambient noise levels. (Significant, Less than Significant with Mitigation)

New buildings and other facilities developed pursuant to the LRDP would introduce stationary sources of noise such as Heating, Ventilation and Air Conditioning (HVAC) equipment and, in certain cases, specialized research equipment. HVAC equipment involves fans and compressors that are designed by the manufacturer to operate quietly and unobtrusively. Because LBNL would install and operate HVAC equipment in compliance with manufacturers' standards, the noise impact to nearby residents and adjacent land uses would be less than significant. Also, in most instances, the nearest off-site sensitive receptors are several hundred feet away from potential development sites, further reducing the potential that HVAC system noise would be apparent to off-site receptors.

Some facilities would include additional new noise sources in the form of specialized equipment. Although it is not possible to accurately forecast the precise nature and type of equipment that might be used in future LBNL facilities, such equipment would generally be installed within purpose-built research buildings that would be designed to attenuate to the maximum extent feasible any unusual noise sources. As with HVAC equipment noise, the extensive setbacks between most portions of the LBNL site and nearby off-site receptors would serve to further minimize noise impacts. There is no reason to believe that appropriate noise engineering techniques could not adequately reduce on-site noise levels such that they would be sufficiently reduced at off-site receptors to avoid disturbance of the surrounding environment. With implementation of the following design-related mitigation measure, the impact of operational noise on the ambient noise environment would be less than significant. Compliance with the local noise ordinance standards (discussed beginning on p. IV.I-4) would reduce the potential noise impact to a less-than-significant level.

> **Mitigation Measure NOISE-4:** Mechanical equipment shall be selected and building designs prepared for all future development projects pursuant to the 2006 LRDP so that noise levels from future building and other facility operations would not exceed the Noise Ordinance limits of the cities of Berkeley or Oakland for commercial areas or residential zones as measured on any commercial or residential property in the area surrounding the future LRDP project. Controls that would typically be incorporated to attain adequate noise reduction would include selection of quiet equipment, sound attenuators on fans, sound attenuator packages for cooling towers and emergency generators, acoustical screen walls, and equipment enclosures.
>
> **Significance after Mitigation:** Less than significant.

Project Variant. The project variant would result in substantially the same noise impacts as the 2006 LRDP and would also include Mitigation Measure NOISE-4. Thus, the impact would be mitigated to a less-than-significant level.

Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of noise impacts. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would potentially result in significant long-term increases in ambient noise levels. With implementation of Mitigation Measure NOISE-4, however, the impact would be reduced to a less-than-significant level.

IV.I.3.5 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. Additional projects currently under way at UC Berkeley, described in Section VI.C of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis is limited to the immediate vicinity of the LBNL main hill site, because this is the only area where noise from LBNL construction or operation could interact with other noise sources. (As described in Impact NOISE-3, project-generated vehicle traffic associated with the proposed LRDP would result in an incremental, and likely imperceptible, long-term increase in ambient noise levels, and that increase would not be sufficient to result in a considerable contribution to any cumulative noise impacts.) This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.I-9) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact NOISE-5: Development under the proposed LRDP would result in temporary contributions to cumulative noise impacts related to construction and demolition activities. (Significant and Unavoidable)

As noted under Impact NOISE-1, construction/demolition activities would occur intermittently at different sites on the LBNL hill site throughout the period of implementation of the proposed 2006 LRDP. Although temporary, construction noise impacts could adversely affect the ambient noise environment within the planning area. In most instances, it can reasonably be anticipated that construction noise impacts on off-site receptors would be reduced to a less-than-significant level through implementation of Mitigation Measures NOISE-1a and NOISE-1b, and the distance to sensitive receptors from most anticipated construction or demolition sites on the Lab property would attenuate potential noise impacts. Moreover, the distance from the Lab hill site to potential off-Lab construction sites that could be expected to generate substantial construction or demolition noise would limit the spatial and temporal overlap between Lab construction projects and those off the Lab site that could potentially result in cumulative construction noise impacts. Nevertheless, it cannot be stated with certainty that there would not be instances during the lifetime of the 2006 LRDP when construction noise emanating from a location on the Lab hill site would contribute to cumulative construction noise impacts. Therefore, for purposes of a conservative analysis, the cumulative impact of construction noise is considered to be significant and unavoidable.

Mitigation: Implementation of Mitigation Measures NOISE-1a and NOISE-1b would reduce the cumulative impact of construction noise to the maximum extent feasible. However, for purposes of a conservative analysis, the cumulative effect of construction noise is considered significant and unavoidable.

Project Variant. The project variant would result in construction noise impacts substantially similar to the noise impacts that would result from the 2006 LRDP development. The contribution of the project variant to cumulative construction noise impacts would therefore be significant and unavoidable, as described above.

Individual Future Project/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. A future project under the LRDP such as conceptually portrayed in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development as discussed above, would also, for the reasons stated above, potentially result in cumulatively considerable construction noise impacts that would considered significant and unavoidable.

Impact NOISE-6: Development pursuant to the 2006 LRDP, together with anticipated future development at LBNL and in the surrounding area, including the UC Berkeley 2020 LRDP, would result in a cumulative increase in noise levels. (Less than Significant)

As noted under Impact NOISE-3, above, even with traffic growth due to implementation of the 2006 LRDP and that attributable to UC Berkeley's LRDP, traffic noise would not increase perceptibly. As indicated in Impact NOISE-4, above, building equipment noise could be mitigated to a less-than-significant level; given that no other development of substance is proposed or anticipated proximate to LBNL (i.e., the majority of the LBNL hill site and the UC Berkeley Hill Campus are currently in open space, as is the vast majority of Tilden Regional Park, and no development of consequence is proposed at any of these locations other than LBNL), no additional substantial noise sources would overlap with noise generated at LBNL. As noted under Impact NOISE-2, development pursuant to the LRDP would not result in significant vibration impacts at off-site receptors. Therefore, no cumulative significant impact is foreseen in the vicinity of the LBNL hill site and, to the extent that ambient noise in the larger area (e.g., downtown Berkeley, Oakland, and other communities) would increase, the 2006 LRDP would not make a considerable contribution to such increases by virtue of its relatively limited effect on overall traffic volumes.

The EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) finds that, with mitigation, the SCIP would result in significant unavoidable noise impacts due to construction and demolition and due to the potential for additional events at the stadium (UC Berkeley, 2006). Moreover, the SCIP Draft EIR identified a cumulative significant noise impact due to potential intermittent overlap between LBNL's Building 51 demolition and the Integrated Projects analyzed in the SCIP DEIR, on sensitive receivers on campus (Bowles Hall) and residents of Panoramic Hill, and determined that this cumulative impact would be significant and unavoidable.

However, as described above under Impact NOISE-1, based on analysis in the Draft EIR for the demolition of Building 51 (LBNL, 2005), noise from demolition of Building 51 would be imperceptible to the nearest sensitive receptors in most instances and below Berkeley Noise Ordinance standards for all receptor locations evaluated. Moreover, new development on the UC Berkeley campus and in the city of Berkeley would be too distant and of insufficient noise energy to have a combined adverse effect on ambient noise at these sensitive receptor areas. Construction noise from the Integrated Projects analyzed in the SCIP Draft EIR would be generated in much closer proximity to sensitive receptors. Therefore, the contribution to cumulative noise impacts of the LBNL 2006 LRDP would not be considerable, and the 2006 LRDP would result in a less-than-significant cumulative impact with regard to noise.

Mitigation: None required.

Project Variant. The project variant would result in noise impacts substantially similar to the noise impacts that would result from the 2006 LRDP development. The cumulative noise impacts of the project variant would therefore be less than significant as described above.

Individual Future Project/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. A future project under the LRDP such as conceptually portrayed in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development as discussed above, would also, for the reasons stated above, result in cumulative noise impacts that would be less than significant.

IV.I.4 References – Noise

LBNL (Lawrence Berkeley National Laboratory, *Demolition of Building 51 and the Bevatron Draft EIR*, October 21, 2005.

UC (University of California) Berkeley, *Southeast Campus Integrated Projects Tiered Focused Final Environmental Impact Report (SCH #2005112056)*; October 31, 2006. Available on the internet at: http://www.cp.berkeley.edu/SCIP/FEIR/SCIP_FEIR.html

UC Berkeley, *2020 Long Range Development Plan and Tien Center Draft EIR*, Prepared by Design, Community & Environment for UC Berkeley Facilities Services, April 15, 2004.

IV.J. Population and Housing

IV.J.1 Introduction

This chapter evaluates the potential population and housing impacts of the proposed 2006 LRDP. The chapter reviews estimates of current Lab population and future Lab population under the proposed LRDP; places of residence for Lab employees; current and future population and housing supply in the City of Berkeley and other locations in the region that house Lab employees; implications of increases in permanent employment at the Lab for population growth and housing demand in Berkeley and elsewhere in the region; potential growth at the Lab in conjunction with other growth expected in Berkeley, including population increases associated with the proposed University of California (UC) Berkeley *2020 Long Range Development Plan;* and the guest population at the Lab and the needs for temporary housing. The primary sources of information used in this chapter include employee place-of-residence summaries provided by the LBNL Facilities Department, Census data, estimates prepared by the State of California Department of Finance and the City of Berkeley, and city and regional projections prepared by the Association of Bay Area Governments (ABAG).

IV.J.2 Setting

IV.J.2.1 Existing LBNL Population

The population at LBNL consists of people whose permanent place of employment is the Berkeley Lab as well as guests who use the Lab's facilities occasionally or work there on a temporary basis collaborating with other scientists and engineers. Guests are not Lab employees; most are employed by other institutions, businesses, or government agencies.

In 2003, there were 3,800 people employed by Berkeley Lab.[1] Most of these employees (56 percent) were full-time employees in scientific and technical positions. Administrative support positions accounted for 16 percent of Lab employment. Faculty (seven percent of the total), and postdoctoral researchers (six percent of the total), as well as undergraduate and graduate students (combined representing 15 percent of the total) were also counted among the Lab's employees.

In 2003, over the course of the year, a total of about 2,500 people used Lab facilities as guests. Guests include industry and government researchers working at the Lab for short-term assignments, scientists visiting from other academic institutions, or people from other institutions such as UC Davis who use Lab facilities regularly over a period of weeks or months. On an average day, 40 percent of total annual guests use Lab facilities. In 2003, this represented about 1,000 people on any given day. The Lab estimates an adjusted total daily population of

1 All employment figures in this section, unless otherwise noted, are on the basis of "head count," or actual persons employed, regardless of whether they work full-time. On a full-time equivalent (FTE) basis, the Berkeley Lab employee population numbered about 3,370 people in 2003 in all locations combined.

4,375 people for 2003, counting both employees and guests; of the total, 3,650 ADP are on the Laboratory's main site on any given day.[2]

IV.J.2.2 Places of Residence for LBNL Employees

Almost 90 percent of LBNL employees live in Alameda and Contra Costa counties. Thirty-three percent live in Berkeley, Albany, and Kensington, and 14 percent live in nearby Oakland, Emeryville, and Piedmont.[3] Another 30 percent of Lab employees live in Contra Costa County, primarily in nearby El Cerrito, Richmond, and San Pablo, and east of the Lab along Highway 24. Four percent of Lab employees live in San Francisco. The rest are distributed throughout other Bay Area communities, and a few live outside the Bay Area. Table IV.J-1 shows the places of residence for Berkeley Lab employees.

TABLE IV.J-1
PLACES OF RESIDENCE FOR LBNL EMPLOYEES

Residential Location	Percent Distribution	Number of Employees[a]
Berkeley, Albany, and Kensington[b]	33%	1,258
Emeryville, Oakland, and Piedmont[c]	14%	521
Other Alameda County	9%	335
El Cerrito, Richmond, and San Pablo	10%	376
Concord, Martinez, Pleasant Hill, and Walnut Creek	9%	327
Lafayette, Moraga, and Orinda	5%	173
Other Contra Costa County	7%	270
San Francisco	4%	167
Other Bay Area[d]	7%	258
Elsewhere in California[e]	3%	115
Total	**100%**	**3,800**

[a] Estimated number of employees living in each location in 2003 based on 2003 headcount employment and distribution of employees by U.S. Postal Service zip code of residence, as reported in the employee database provided by the LBNL Facilities Department, April 14, 2004.
[b] Berkeley, Albany, and Kensington cannot be separately identified in employee place of residence data provided by zip code.
[c] Emeryville, Oakland, and Piedmont cannot be separately identified in employee place of residence data provided by zip code.
[d] Employees live in all other Bay Area counties. No one community is home to more than one percent of LBNL employees.
[e] Most of these people live in San Joaquin County and the Davis/Sacramento area.

SOURCE: Lawrence Berkeley National Laboratory and Hausrath Economics Group.

[2] The Lab's estimate of adjusted daily population (ADP) is defined to include FTE employment plus 40 percent of total annual guests.

[3] Place-of-residence data for Lab employees is tabulated by U. S. Postal Service zip code. Some zip codes in Berkeley also cover Albany and Kensington, and some zip codes in Oakland also cover Emeryville and Piedmont.

Lab employees living in Berkeley and Albany represented 1.0 percent of the combined population of those cities in 2003.[4] Lab employees and their dependents represented 2.0 percent of the Berkeley and Albany population in 2003.[5] In all other residential locations, Lab employees and their dependents accounted for less than one percent of the total population. The percentage of the residential population associated with LBNL employment was greatest in nearby communities—in 2003, Lab employees and their dependents represented 0.3 percent of the total population of Emeryville, Oakland and Piedmont; 0.6 percent of the total population of El Cerrito, Richmond, and San Pablo; and 0.7 percent of the total population of Lafayette, Moraga, and Orinda. For the Bay Area region as a whole, Lab employees and the other members of their households represented 0.1 percent of total regional population in 2003.

IV.J.2.3 Overnight Accommodations for LBNL Guests

Guests include out-of-town visitors who require temporary lodging, as well as people who live within a reasonable commute distance and use Lab facilities for the day, returning home in the evening. There is no permanent or temporary overnight accommodation at the LBNL site (although a User Guest House is identified as one of the projects in the LRDP's Illustrative Development Scenario; see Appendix D for a description of the User Guest House and see discussion under Impact J.1, below).

The Lab leases five apartments on Oxford Street in downtown Berkeley to provide short-term overnight accommodation for visiting researchers. The apartments are administered by the LBNL Advanced Light Source (ALS) but are available to visiting researchers from any area of the Laboratory. Each apartment has two bedrooms and can accommodate a maximum of four people. The Lab's lease costs are recovered in full by daily or monthly rates charged to the visitors using the apartments. On average, the apartments are 80 percent occupied over the course of the year. The typical length of stay is seven nights.[6]

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4 The total population for the City of Berkeley in 2003 is estimated at 108,169 by City of Berkeley staff, after accounting for a documented Census 2000 undercount of group quarters population. This estimate is provided in a letter to the State of California Department of Finance (DOF). (See letter to Steve Peace, Director, California Department of Finance, from Weldon Rucker, City Manager, City of Berkeley, June 23, 2003, "Recommended increase to Berkeley's 2000 population baseline.") The DOF estimates a total population of 16,787 for the City of Albany in 2003. Kensington is part of unincorporated Contra Costa County, so the DOF does not provide a separate population estimate. Because the number of Lab employees living in Kensington cannot be separately identified in the zip code database, these comparisons overstate by a small amount the proportion of the Berkeley and Albany population represented by Lab employees and their dependents.

5 The dependents of Lab employees are estimated separately for student employees and non-student employees. The analysis assumes that each Lab employee represents one household. (This is a conservative estimate since it is known that there are households that contain more than one Lab employee.) For non-student employees, the additional population associated with Lab employees is estimated based on the average household size for households by place of residence. According to the 2000 Census, for the cities of Berkeley and Albany, the average household size is 2.18 persons per household; and for Oakland, Emeryville, and Piedmont combined, the average household size is 2.47 persons per household. For student employees, the number of dependents is estimated at 0.12 per student. This estimate is based on analysis of 1997 public access data available from the UC Berkeley Office of Student Research describing marital status and number of children for undergraduate and graduate students.

6 Barbara Phillips, ALS Housing Coordinator, personal communication, December 15, 2003.

Other overnight accommodation options for Lab guests include hotels, bed and breakfast accommodations, and motels in Berkeley, Emeryville, and Oakland and the homes of Lab employees. Other guests are researchers who use Lab facilities occasionally but live within a day's drive and therefore do not require overnight accommodation near the Lab.

IV.J.2.4 Recent Regional Population and Housing Trends

There were 6.8 million people living in the nine-county Bay Area region in 2000. The region's population grew at a compound rate of 1.2 percent per year from 1990 to 2000. The Bay Area also produced substantial increases in employment opportunities in the 1990s. The number of jobs increased at a compound rate of 1.6 percent per year, growing to a total of 3.8 million jobs in the nine-county region in 2000.

Throughout the state and the region, the rate of new housing production slowed substantially over the last two decades. Housing production has not kept pace with demand associated with employment growth, in-migration, and household formation. Between 1990 and 2000, about 187,000 housing units were added in the region (an eight-percent increase). During the same period, the number of employed residents increased by 456,000 (14 percent) and the number of jobs increased by 548,000 (17 percent). Housing price increases reflect this imbalance between supply and demand. In April 2003, market prices for single-family homes in the Bay Area were about double the price levels observed in 1990. In April 2003, the average single-family home price in the Bay Area was $580,000. New home prices in the Bay Area are 50 to 70 percent higher than new home prices in neighboring San Joaquin and Stanislaus counties, and prices for existing homes in the Bay Area are more than double those in the neighboring counties.[7]

Population and employed population growth in the Bay Area have been accommodated through increases in the number of people and workers living in both existing and new units. There has also been a substantial increase in the number of people working in the Bay Area but living in surrounding counties where new housing is more plentiful and more affordable.

IV.J.2.5 Recent Population and Housing Trends in the City of Berkeley

Population and Housing Totals

It is important to understand conditions in the City of Berkeley because LBNL is one of the largest employers in the city; changes in Lab population have the most impact in the City of Berkeley. Table IV.J-2 shows population and housing trends for the City of Berkeley between 1970 and 2000. A total of about 106,000 people lived in the City of Berkeley in 2000. Berkeley's population peaked at 116,700 in 1970. After declining by 14,000 people (12 percent) from 1970 to 1990, the city's population increased by about 3,600 people between 1990 and 2000—a 3.5 percent increase. A larger increase in the number of people living in households (about 5,500 people) during this period was offset by a decline in the population living in group quarters

7 Real Estate Research Council of Northern California, *Northern California Real Estate Report,* First Quarter 2003.

TABLE IV.J-2
POPULATION, HOUSEHOLDS, AND HOUSING IN THE CITY OF BERKELEY, 1970, 1980, 1990, AND 2000

					Change 1970 – 1980		Change 1980 – 1990		Change 1990 – 2000	
	1970	1980	1990	2000	No.	%	No.	%	No.	%
Total Population[a]	116,716	103,328	102,724	106,354	(13,388)	-11%	(604)	-0.6%	3,630	3.5%
Household Population[b]	106,110	94,343	91,442	96,921	(11,767)	-11%	(2,901)	-3.1%	5,479	6.0%
Group Quarters[c]	10,606	8,985	11,282	9,433	(1,621)	-15%	2,297	25.6%	(1,849)	-16.4%
Housing Units	47,365	46,334	45,735	46,875	(1,031)	-2%	(599)	-1.3%	1,140	2.5%
Households[d]	45,655	44,704	43,453	44,955	(951)	-2%	(1,251)	-2.8%	1,502	3.5%
Persons per Household	2.32	2.11	2.10	2.16						

[a] Total population consists of household population and population living in group quarters. The estimate for 2000 is adjusted from the published 2000 Census count, to correct for inadequate enumeration of group quarters populations in the city, particularly adjacent to the UC Berkeley campus. The adjustments are detailed in a June 23, 2003 letter from Weldon Rucker, City Manager, to Steve Peace, Director of Finance for the State of California, "Recommended increase to Berkeley's 2000 population baseline."
[b] Household population consists of persons living in housing units such as a houses, apartments, mobile homes, or a single room where residents live and eat separately from others in the building.
[c] Group quarters population consists of institutionalized persons and other persons living in group homes, rooming houses, dormitories, and emergency shelters. In Berkeley, most of the group quarters population consists of students living in college dormitories. The estimate for 2000 is adjusted from the published 2000 Census count, to correct for inadequate enumeration of group quarters populations in the city, particularly adjacent to the UC Berkeley campus. The adjustments are detailed in a June 23, 2003 letter from Weldon Rucker, City Manager, to Steve Peace, Director of Finance for the State of California, "Recommended increase to Berkeley's 2000 population baseline."
[d] The number of households is equivalent to the number of occupied housing units.

SOURCE: U.S. Department of Commerce, Bureau of the Census, *Census of Population and Housing: 1970, 1980, 1990*, *and Census 2000;* City of Berkeley.

(primarily students). The City of Berkeley population estimates for 2000 discussed here and presented in Table IV.J-2 reflect adjustments proposed by the City of Berkeley to account for enumeration errors by the Census Bureau, particularly with regard to group quarters populations.[8]

Through the two decades of declining overall population (1970–1990), group quarters population declined and then increased, so most of the overall decline was a consequence of changes in the occupants of existing households. Average household size declined to a low of 2.1 persons per household in 1990 from a high of 2.3 persons per household in 1970. Loss of housing stock and households in the City between 1970 and 1990 also contributed to population decline. The reasons for the decline in housing stock include demolition of some residential hotel rooms to make way for office or tourist use, removal of secondary (often illegal) units as those units were

8 The Census Bureau counted 11,282 people living in group quarters in the City of Berkeley in 1990 and only 5,822 people in group quarters in 2000. During this time period, the University of California had actually increased the capacity of its group quarters housing facilities. The City of Berkeley claims that Census Bureau enumeration efforts in 2000 were inadequate and documents Census Block and building level information in support of a revised group quarters population estimate for the City. This documentation is provided in a letter to the State of California Department of Finance (DOF), requesting revisions in future population estimates prepared by DOF. (See letter to Steve Peace, Director, California Department of Finance, from Weldon Rucker, City Manager, City of Berkeley, June 23, 2003, "Recommended increase to Berkeley's 2000 population baseline.") DOF's Official State Estimates for January 1, 2000—before updating to include the results of the 2000 Census—showed a total population for the city of 109,463.

reabsorbed into the primary unit, and use of multiple units by a single family.[9] Most of the declines occurred during the decade of the 1970s.

Population growth in Berkeley between 1990 and 2000 has been accommodated in the existing housing stock and in new housing units. Average household size increased to 2.16 persons per household in 2000 from 2.10 persons per household in 1990, and there was a decline in the number of vacant housing units in the City, as vacant units became occupied. The most important reason for the population growth, however, after two decades of decline, was the increase in the housing stock. Following a net increase of over 1,100 housing units in the City of Berkeley between 1990 and 2000, the total housing stock numbered 46,875 units in 2000.

Characteristics of Housing Stock

Table IV.J-3 lists types of housing units in the City of Berkeley. More than half (54 percent) of the housing units in the city are in multi-unit buildings, and most of these are in buildings of five units or more. Forty-three percent of the housing stock is single-family detached housing, and the small balance (less than four percent) is single-family attached housing.

TABLE IV.J-3
CHARACTERISTICS OF THE HOUSING STOCK, CITY OF BERKELEY, 2000

	Number of Units	Percent of Total Units
Units in Structure		
1 unit, detached	20,097	43%
1 unit, attached	1,757	4%
2-4 units	9,298	20%
5-9 units	4,934	11%
10 or more units	10,730	23%
Mobile home, trailer, or other	59	0%
Total Housing Units	**46,875**	**100%**
Occupied Housing Units	**44,955**	**100%**
Owner-occupied units	19,214	43%
Renter-occupied units	25,741	57%
Vacant housing units	1,920	
Homeowner vacancy rate	0.7%	
Rental vacancy rate	2.8%	

SOURCE: U.S. Census Bureau, *Census 2000.*

Housing prices in Berkeley are among the highest in the region. Semi-annual price surveys indicate an average price of $625,000 in Berkeley in April 2003, 115 percent greater than price levels observed in April 1990.[10]

9 City of Berkeley, *Conditions, Trends, and Issues Report,* 1993.
10 Real Estate Research Council of Northern California, *Northern California Real Estate Report,* First Quarter 2003.

In 2000, 43 percent of the City's housing stock was owner-occupied and 57 percent was renter-occupied. About 19,000 of the rental units are registered with the city's Rent Stabilization Board and another 1,500 rental units are rent-restricted affordable units.[11] Just under half of all rental housing in the city is located within a few blocks of the UC Berkeley campus.[12]

The housing supply in Berkeley continues to increase. In December 2003, the city's list of projects pending before either the Zoning Adjustments Board or the City Council included proposals representing a total of 681 dwelling units. Many of these projects are high density, mixed use, rental and condominium projects proposed by private and non-profit developers in downtown Berkeley and along transit corridors.[13] In addition, the University of California recently completed the College Durant apartments, providing apartment-style housing for 120 students. Additional apartment-style and infill dormitory-style housing is currently under construction and will add another 1,120 beds south of the campus.[14]

IV.J.2.6 Housing Development Potential in Berkeley

The City of Berkeley has a very limited supply of vacant or underutilized land on which to develop substantial amounts of housing. After down-zoning in the 1970s, there is essentially no capacity to add to the housing supply within existing residential areas. Three-quarters of the City's 100-acre inventory of vacant and underutilized land is either in the Hills Overlay District, where steep slopes prohibit development, or near the Hayward fault. What land is available (parking lots and vacant parcels along major streets in the downtown area, central Berkeley, and south Berkeley) is expensive to build on and is also suited for non-residential uses that may generate higher returns.[15]

Furthermore, in addition to limited opportunity sites, there are other governmental constraints that discourage substantial private sector residential development in Berkeley. Berkeley's permit process is more rigorous than in most cities. The City requires discretionary review and a use permit for all residential construction, rather than having areas where specified densities are allowed as of right. This adds to the time and cost required for development.[16]

Nevertheless, the City's Land Use and Housing Element policies are designed to expand the housing supply in appropriate locations, particularly along major transit corridors and in the downtown, while maintaining the physical character of existing neighborhoods. In addition to encouraging high- and medium-density development through zoning, density bonuses (for affordable housing), and reduced parking requirements where appropriate, the Housing Element also identifies City-owned sites that have the potential for significant housing and/or mixed-use development.[17] City staff have projected that these policies, in combination with a strong regional

[11] City of Berkeley, *General Plan Housing Element*, December 18, 2001, pages H-3 – H4.
[12] City of Berkeley, *General Plan Housing Element: Housing Element Appendix, 2001*, page 8.
[13] City of Berkeley, "Pending Zoning Public Matters," as of December 12, 2003.
[14] These recently completed and under construction UCB housing projects are all part of the Underhill Area Projects approved by the UC Regents in 2000.
[15] City of Berkeley, *General Plan Housing Element: Housing Element Appendix*, pages 24-25.
[16] City of Berkeley, *General Plan Housing Element: Housing Element Appendix*, pages 27-28.
[17] City of Berkeley, *Planning Commission General Plan*, December 2001, page H-13.

economy, could result in substantial additions to the housing stock in Berkeley, assuming a pace of development over the long-term future consistent with recent trends.[18]

IV.J.2.7 Regional Population and Household Projections

Projections prepared by the ABAG in June 2003 reflecting a “smart growth forecast” for the Bay Area show regional population growth of almost 1.7 million and an increase of about 600,000 households for the 2001–2025 period (see Table IV.J-4). For the region as a whole, the projection is for growth of 25 percent over levels in 2000. In a departure from previous trend-based forecasts, this population and housing scenario reflects a “smart growth” vision: emphasizing infill development to revitalize central cities, support and enhance public transit, and preserve open space and agricultural land. The smart growth scenario assumes that local policies and regulations that currently limit this type of development are changed and that there is significant public investment on a regional and local level in infrastructure and in housing to achieve higher levels of housing production, and particularly high density housing near transit. The “smart growth” scenario illustrates a development pattern that, over the long term, assumes central Bay Area locations such as San Francisco, Berkeley, Oakland, Emeryville, Alameda, Fremont, Union City, Albany, El Cerrito, and Richmond absorb more housing production and population growth than would otherwise be the case. Regionally and locally, the scenario has implicit benefits in an improved balance of jobs and housing, less in-commuting, and more efficient development patterns that preserve open space and agricultural land.

Population and household growth for Berkeley and Albany represent about one percent of the total population and household growth forecast for the Bay Area region.[19] Population growth is expected to continue in the City of Berkeley, building on the trends of the 1990s. The “smart growth forecast” shows an increase of over 13,000 people in the City of Berkeley between 2000 and 2025 (a 13-percent increase over 2000 levels) and an increase of almost 5,000 households in the city (an 11-percent increase over that same period). Using the adjusted 2000 population count for the City of Berkeley as a base, the total population living in the city could reach 119,700 by 2025. In Albany, population is forecast to increase by 14 percent to a total of 18,700 people in 2025. The forecast shows an additional 850 households in Albany between 2000 and 2025, an increase of 12 percent over the period.

The numerical and percentage increases in population and housing are expected to be greater in other parts of the Bay Area that house substantial numbers of Berkeley Lab employees. The expected increases in population and households are around 20 percent or more in Oakland, Emeryville, and Piedmont; in El Cerrito, Richmond, and San Pablo; and in central Contra Costa County communities.

18 City of Berkeley, *General Plan Housing Element: Housing Element Appendix A*, page 7.
19 Berkeley and Albany are combined because Lab employee place of residence database does not allow separate identification of these cities. In this analysis, Kensington, part of unincorporated Contra Costa County, is included in the “Rest of Contra Costa County.”

TABLE IV.J-4
POPULATION AND HOUSEHOLD PROJECTIONS FOR THE BAY AREA REGION, 2001 TO 2025

Geographic Area	2000	2025	2000 – 2025 Change	2000 – 2025 Percent Change	2000 – 2025 Annual Rate
Total Population					
Berkeley and Albany[a]	122,800	138,400	15,600	13%	0.5%
Emeryville, Oakland, and Piedmont	417,300	510,400	93,100	22%	0.8%
Rest of Alameda County	907,200	1,150,600	243,400	27%	1.0%
El Cerrito, Richmond, and San Pablo	152,600	179,700	27,100	18%	0.7%
Concord, Martinez, Pleasant Hill, and Walnut Creek	254,800	300,000	45,200	18%	0.7%
Lafayette, Moraga, and Orinda	57,800	64,900	7,100	12%	0.5%
Rest of Contra Costa County	483,600	671,800	188,200	39%	1.3%
San Francisco	776,700	889,800	113,100	15%	0.5%
Rest of the Bay Area	3,614,500	4,555,800	941,300	26%	0.9%
Total Bay Area[b]	**6,787,400**	**8,461,400**	**1,674,000**	**25%**	**0.9%**
Households					
Berkeley and Albany	52,000	57,800	5,800	11%	0.4%
Emeryville, Oakland, and Piedmont	158,600	193,900	35,300	22%	0.8%
Rest of Alameda County	312,800	390,600	77,800	25%	0.9%
El Cerrito, Richmond, and San Pablo	53,900	64,400	10,500	19%	0.7%
Concord, Martinez, Pleasant Hill, and Walnut Creek	102,400	122,200	19,800	19%	0.7%
Lafayette, Moraga, and Orinda	21,400	24,500	3,100	14%	0.5%
Rest of Contra Costa County	166,500	233,900	67,400	40%	1.4%
San Francisco	329,700	381,800	52,100	16%	0.6%
Rest of the Bay Area	1,268,800	1,596,500	327,700	26%	0.9%
Total Bay Area	**2,466,000**	**3,065,400**	**599,400**	**24%**	**0.9%**

Note: Numbers may not add to totals due to independent rounding.

[a] Albany is combined with Berkeley in this table because place of residence data for Lab employees does not allow separate identification of these cities. In this table and the associated text discussion, Kensington, part of unincorporated Contra Costa County, is included in the "Rest of Contra Costa County." The numbers for Kensington are relatively small. In *Projections 2003*, ABAG uses the 2000 Census population counts for Berkeley, which the city contends are too low (see Table IV.J-2 and associated text). Therefore, the year 2000 population estimate for the City of Berkeley used in this table is the adjusted count prepared by the City. All other year 2000 estimates for geographic subareas are as published in *Projections 2003*. The adjustment for the estimated 2000 undercount is carried over to the 2025 projection. In *Projections 2003,* ABAG forecasts a population increase of over 13,000 for the City of Berkeley—primarily household population. That population growth—added to the adjusted year 2000 population—results in a total population estimate of 119,700 for the City of Berkeley in 2025. Accounting for the year 2000 adjustment for the group quarters undercount, this number is 3,600 greater than the 2025 population estimate for the City of Berkeley published in *Projections 2003*.

[b] The regional population totals for 2000 and 2025 shown in this table do not precisely match the published ABAG regional totals because of the difference in the population estimate for the City of Berkeley (a difference of about 3,600 people). The adjustment for the estimated 2000 undercount is carried over to the 2025 projection, as explained in the note above.

SOURCE: ABAG, *Projections 2003*; City of Berkeley.

IV.J.2.8 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned by The Regents of the University of California. As such, LBNL is generally exempted under the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies contained in the Berkeley and Oakland general plans.

Berkeley General Plan

The City of Berkeley Draft General Plan was published in October 2000 and on December 18, 2001 the Berkeley City Council certified the General Plan EIR and approved the Housing, Land Use, and Transportation Elements. In spring 2002, the City Council approved the six remaining elements of the General Plan.

The Housing Element expresses a key local policy objective related to population and housing impacts.[20]

> The University of California and other institutions should take responsibility for housing demands they generate which create additional pressure on the private housing market in Berkeley. By doing so, they would help avoid causing or increasing housing problems for other Berkeley residents. The City will work with the University and other State institutions to create new housing and jointly address housing issues of mutual concern.

Specific policies and actions addressing this relationship with other institutions are as follows:[21]

> <u>Policy H-33 University of California</u>: Urge the University of California to maximize the supply of appropriately located, affordable housing for its students, and also to expand housing opportunities for faculty and staff.
>
> <u>Policy H-34 Group Quarters</u>: Support and encourage construction of group housing near the University for student housing.
>
> <u>Policy H-35 University Housing and Taxes</u>: Support development of new housing for University-related households and other institutions that will not take additional land off tax rolls…
>
> <u>Policy H-35 University Housing and Displacement</u>: Support University-related housing that avoids displacement of existing residents of a loss of existing rental housing resources available to other city residents.

[20] City of Berkeley, *General Plan Housing Element*, December 2001, page H-8.
[21] City of Berkeley, *General Plan Housing Element*, December 2001, pages H-15 – H-16.

A related Land Use Element policy also addresses University housing:[22]

> Policy LU-37 University Housing: Encourage the University to maximize the supply of housing for students, faculty, and staff to minimize the impacts of the University on the citywide supply of housing.

Oakland General Plan

The Oakland General Plan Land Use and Transportation Element was approved in March 1998. Policy language is focused on economic development (Industry and Commerce policies), Transportation and Transit-Oriented Development, Downtown, the Waterfront, and the Neighborhoods, as well as Housing; there is limited discussion of institutional uses and employment:

> Policy N2.3 Supporting Institutional Facilities: The City should support many uses occurring in institutional facilities where they are compatible with surrounding activities and where the facility site adequately supports the proposed uses.

> Policy N2.5 Balancing City and Local Benefits of Institutions: When reviewing land use permit applications for the establishment or expansion of institutional uses, the decision-making body should take into account the institution's overall benefit to the entire Oakland community, as well as its effects upon the immediately surrounding area.

> Policy N2.8 Long Range Development Planning: Require, where legally allowed, and encourage in all other situations, those institutions designated with the "Institutional" land use classification should be required to present Long Range Operation and Development Plans to the City Planning Commission. While these plans could be binding or non-binding, they should present realistic information regarding the continued operation and/or expansion of the facilities. The City suggests that substantial public input be built into the process of developing the plans. The plans could be required as a part of the development applications, or on a periodic basis.

IV.J.3 Impacts and Mitigation Measures

IV.J.3.1 Significance Criteria

In accordance with Appendix G of the state CEQA Guidelines and the UC CEQA Handbook, the impact of the proposed LRDP on population and housing would be considered significant if it would exceed the following Standards of Significance:

- Induce substantial population growth or concentration of population in an area, either directly (for example, by proposing new housing and/or businesses), or indirectly (for example, through extension of roads or other infrastructure);
- Displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere; or

[22] City of Berkeley, *General Plan Land Use Element*, December 2001, pages LU-20 – LU-21.

- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

This EIR provides no additional analysis of the second and third bulleted impact criteria above since, as stated in the Initial Study, the proposed 2006 LRDP would not displace existing housing and would not displace people. Therefore, no impact would occur, and no additional analysis is required.

IV.J.3.2 Impact Assessment Methodology

The assessment of population and housing impacts in the EIR is based on information obtained from the following sources:

- Lawrence Berkeley National Lab, including staff responses to data requests, and the *Long Range Development Plan 2005, March 31, 2004 Working Draft.*
- University of California data and information describing students, faculty, and staff, and their characteristics.
- City of Berkeley documents and correspondence related to population adjustments.
- State of California and U.S. Department of Commerce Census Bureau estimates of current population and housing.
- ABAG *Projections 2003*.

The population and housing impact analysis assesses the impact of employee population associated with the 2006 LBNL LRDP in the context of other population growth and increases in the housing supply expected in the City of Berkeley and the rest of the Bay Area region. As is common practice, the analysis conservatively assumes that all new permanent Lab employees under the proposed 2006 LRDP would move to the Bay Area region from elsewhere when, in fact, some may already live in the region and therefore would not add to regional population or housing demand. The analysis also conservatively assumes one Lab employee per household.

The impact analysis also accounts for the “dependent” population residing in the households of Lab employees. There are different factors for student and non-student employees. Estimates of household dependents for student employees are based on UC Berkeley survey data describing students by marital status and number of children. Household population factors for non-student employees are sensitive to place of residence of Lab employees; these non-student employee households are assumed to be similar to the average household in the communities in which they live.

The employee database summarizing current places of residence by zip code is the basis for assumptions about the likely residential choice of Lab employees in the future. As noted above, the zip code database does not allow separate identification of some places of residence. Among communities near the Lab, Berkeley, Albany, and Kensington share zip codes, as do Emeryville, Oakland, and Piedmont. In the subsequent impact analysis, the proportions of Lab employees in

Berkeley and Albany may be overstated by a small amount to the extent that the place of residence percentages used to develop the estimates also count employees living in Kensington. Any distortion is small and does not affect the conclusions of the analysis.

The population and housing impact analysis also evaluates the increase in guest population associated with the LBNL 2006 LRDP. This analysis considers the User Guest House conceptually portrayed in the Illustrative Development Scenario to provide visiting researchers with short-term accommodations on the LBNL hill campus.

In addition to providing the environmental impact analysis for the LRDP, the analysis in this EIR will be used in connection with later approvals of specific activities pursuant to the LRDP. The Lab will evaluate the impacts on population and housing of any later activity implemented pursuant to the LRDP and compare those impacts with the evaluation in this program EIR to determine the appropriate level of any further CEQA review that may be required before approval of the later activity. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3). This determination will be subject to the further restrictions on use of this document imposed in response to comments from the City of Berkeley, as described in Chapter I.

IV.J.3.3 Impacts and Mitigation Measures

Impact POP-1: The proposed LRDP would produce an increase in the number of people working at LBNL but would not induce substantial population growth in the City of Berkeley or elsewhere in the region, either directly or indirectly. (Less than Significant)

Under the proposed 2006 LRDP, the population of people working at LBNL would increase. For the originally proposed 2006 LRDP, the Lab estimated that the total adjusted daily population (or ADP – consisting of both permanent employees and guests) would increase from 4,375 in 2003 to 5,525 in 2025, an increase of 1,150 people or 26 percent. Based on the current ratio of permanent employees (measured by head count) to ADP, permanent employment at the Lab under the originally proposed 2006 LRDP would increase from 3,800 in 2003 to about 4,800 in 2025, an increase of about 1,000 employees or 26 percent. The originally proposed 2006 LRDP would also result in an increase in the number of guests using LBNL facilities for short-term research and other temporary assignments. The number of guests expected on an annual basis would increase from 2,500 in 2003 to 3,200 in 2025 – an increase of 700 or 28 percent. Assuming 40 percent of total annual guests use Lab facilities on any given day (as has generally been the case), in 2025 there would be about 1,280 guests at LBNL on any given day.

Compared to the originally proposed 2006 LRDP, the currently proposed 2006 LRDP would produce slightly less employment growth at LBNL. The total ADP would increase from 4,375 in 2003 to 5,375 in 2025, an increase of 1,000 people or 23 percent. Permanent employment at the

Lab would increase from 3,800 in 2003 to about 4,700 in 2025, an increase of about 900 employees or 24 percent. The annual number of guests would increase from 2,500 in 2003 to 3,100 in 2025 – an increase of 600 or 24 percent. Assuming 40 percent of total annual guests use Lab facilities on any given day, in 2025 there would be 1,240 guests at LBNL on any given day.

The impact analysis below regarding population growth is based on the more conservative employment projections associated with the original 2006 LRDP proposal of 2.56 million gsf of potential development. This more conservative analysis will ensure that the Lab has thoroughly evaluated potential impacts associated with employment growth.

The increase in permanent employees would add to the residential population in Berkeley, other nearby communities, and the rest of the region and would add to the demand for permanent housing. The increase in guests would add to demand for temporary accommodations. This impact assessment addresses both sets of concerns.

Impacts of Lab Permanent Employee Population

The increase in permanent employment at LBNL associated with the proposed 2006 LRDP would result in an increase in the residential population in nearby communities and elsewhere in the region. The distribution of employees by classification is not expected to change substantially. Students would continue to account for 15 percent of Lab permanent employment. Table IV.J-5 shows the distribution of Lab permanent employment by classification for 2003 and projected for 2025.

TABLE IV.J-5
LBNL PERMANENT EMPLOYMENT BY CLASSIFICATION, 2003 AND 2025

	Number of Employees[a]		Percent Distribution	
Employee Classification	**2003**	**2025[b]**	**2003**	**2025**
Scientific and Technical Staff	2,150	2,760	56%	58%
Faculty	250	325	7%	7%
Postdoctoral Researchers	230	295	6%	6%
Administrative Support	610	695	16%	14%
Students	560	725	15%	15%
Total Employment	**3,800**	**4,800**	100%	100%

[a] Only permanent employees on the Lab payroll are counted in this table. Lab visitors and guests are excluded. Employees are measured in terms of head count, consistent with Lab estimates of adjusted daily population.
[b] Estimated number of employees under originally proposed 2006 LRDP. Number of employees under currently proposed 2006 LRDP would be less (approximately 4,700).

SOURCE: Lawrence Berkeley National Laboratory.

Assuming that future Lab employees make the same residential location decisions as current Lab employees, most would choose to live in Berkeley, in Albany, and in other communities near their place of employment. There would also be additional household population living in those Lab employee households. Table IV.J-6 presents estimates of the Lab employee population and associated household population by place of residence in the Bay Area under the proposed LRDP.

TABLE IV.J-6
ESTIMATED LBNL EMPLOYEE AND ASSOCIATED HOUSEHOLD POPULATION BY PLACE OF RESIDENCE UNDER PROPOSED LRDP IN 2025

Place of Residence[a]	Non-Student Employees	Other Population in Non-Student Employee Households[b]	Student Employees	Other Population in Student Employee Households[c]	Total Population	Percent of Total Population in 2025
Berkeley and Albany[d]	1,350	1,594	240	29	**3,213**	2.32%
Emeryville, Oakland, and Piedmont	559	824	99	12	**1,494**	0.29%
Other Alameda County	359	720	64	8	**1,151**	0.10%
El Cerrito, Richmond, and San Pablo	403	722	72	9	**1,206**	0.67%
Concord, Martinez, Pleasant Hill, and Walnut Creek	351	508	62	8	**929**	0.31%
Lafayette, Moraga, and Orinda	185	299	33	4	**521**	0.80%
Other Contra Costa County	290	547	52	6	**895**	0.13%
San Francisco	179	232	32	4	**447**	0.05%
Other Bay Area[e]	400	712	71	9	**1,192**	0.03%
Total	**4,076**	**6,158**	**725**	**89**	**11,048**	**0.13%**

Note: Population estimates are based on originally proposed 2006 LRDP. Population under currently proposed 2006 LRDP would be less. See text.

a The distribution of employees by place of residence is based on the characteristics of the Lab population described in Table IV.J-1.
b Each employee is assumed to represent one household. The household size for Lab non-student employee households is assumed to be the same as the average for all other households in that place of residence. The average household size estimates by place of residence are derived from the 2000 Census.
c Each employee is assumed to represent one household. The dependent household population for Lab student employee households is calculated separately for undergraduate and graduate student employees. Counting spouses and children, the additional household population associated with undergraduate students is 0.07 per student and the additional household population associated with graduate students is 0.16 per student. The weighted average for Lab student employees is 0.12 per student. These estimates of additional dependent household population are based on 1997 public access student housing and transportation data from the University of California Berkeley Office of Student Research.
d The analysis may overstate by a small amount the increase of Lab-related population living in Berkeley and Albany because the estimate is based on place of residence data by zip code that also includes any employees who might live in Kensington in unincorporated Contra Costa County.
e For purposes of comparison to Bay Area population totals, this analysis conservatively combines the three percent of Lab employees living outside the Bay Area with the seven percent living in communities outside of Alameda, Contra Costa, and San Francisco counties.

SOURCE: Lawrence Berkeley National Laboratory; *Census 2000;* UC Berkeley Office of Student Research; ABAG, *Projections 2003*; and Hausrath Economics Group.

In total, there would be a household population of about 11,000 people associated with Lab permanent employment in 2025. In addition to about 4,100 non-student employees, another 6,200 people would be living in the households of those employees. In addition to about 700 student employees, about 90 dependents would be living in those student employee households.

Assuming all employees lived in the nine-county Bay Area region, the total household population associated with LBNL employees under the proposed LRDP (11,000) would represent 0.13 percent of total regional population in 2025.

Most Lab employees would live in Berkeley and other nearby cities. About 3,200 people living in Berkeley and Albany in 2025 would be associated with Lab permanent employment under the proposed LRDP. This population would represent about two percent of the total number of people projected to be living in the Berkeley and Albany in 2025. In all other places of residence, Lab employees and their associated household population would represent less than one percent of total projected population in 2025. The next largest number of people associated with LBNL employees would live in nearby Emeryville, Oakland, and Piedmont—almost 1,500 people, accounting for less than one-half of one percent of the total population projected for those cities in 2025. Lab employees and household members would represent larger shares of the total population projected for subareas of Contra Costa County: El Cerrito, Richmond, and San Pablo; Concord, Martinez, Pleasant Hill, and Walnut Creek; and Lafayette, Moraga, and Orinda.

The increase in Lab permanent employment associated with the proposed LRDP would result in demand for permanent housing. Assuming one employee per household and assuming all new employees would be new to the Bay Area region, employment growth at the Lab would result in demand for 1,000 housing units in the region between 2003 and 2025. Between 2000 and 2025, ABAG projects an increase of almost 600,000 households in the Bay Area, assuming successful implementation of smart growth policies and development patterns throughout the region. Almost half of that household and housing growth (45 percent of the regional total) is projected for Alameda, Contra Costa, and San Francisco counties, where most Lab employees would be likely to choose to live.

Generally, the housing demand associated with permanent employment growth under the proposed LRDP would be satisfied by the housing that could be added in Berkeley and other nearby communities. Table IV.J-7 compares the housing demand associated with Lab employment growth to household projections. In most communities where LBNL employees live, housing demand associated with increases in LBNL employment under the LRDP would account for less than one percent of the total increase in households projected for those communities. In Berkeley and Albany, Lab employee households would represent 5.7 percent of the increase expected between 2000 and 2025. In Lafayette, Moraga, and Orinda, Lab employee households would represent about 1.6 percent of the expected household increase.

The regional smart growth forecast projects the addition of almost 5,000 households in the City of Berkeley, between 2000 and 2025, and another 850 households in Albany. Assuming 33 percent of the new Lab employees would choose to live in Berkeley or Albany, that number of households (330) would represent about six percent of the total additional households projected for those cities between 2000 and 2025 if the smart growth forecast were realized.[23] That potential addition to housing demand in Berkeley and Albany represented by the increase in employee population associated with the proposed 2006 LRDP would represent a relatively large share of the local housing market.

[23] This number and percentage would be lower if students were assumed to be accommodated in the group quarters housing stock and not in households. However, many UC Berkeley students do not live in group quarters housing; those with jobs at places such as Berkeley Lab are most likely to look for housing in the private housing market in Berkeley.

TABLE IV.J-7
INCREASE IN LBNL EMPLOYEE HOUSEHOLDS COMPARED TO TOTAL HOUSEHOLD GROWTH BY PLACE OF RESIDENCE

Place of Residence	Total Household Growth 2000 – 2025[a]	Households Associated with Increase in Lab Employment[b]	Lab Household Increase as Percent of Total Household Growth
Berkeley and Albany[c]	5,800	330	5.7%
Emeryville, Oakland, and Piedmont	35,300	140	0.4%
Other Alameda County	77,800	90	0.1%
El Cerrito, Richmond, and San Pablo	10,500	100	1.0%
Concord, Martinez, Pleasant Hill, and Walnut Creek	19,800	90	0.5%
Lafayette, Moraga, and Orinda	3,100	50	1.6%
Other Contra Costa County	67,400	70	0.1%
San Francisco	52,100	40	0.1%
Other Bay Area[d]	327,700	90	0.0%
Total	**599,500**	**1,000**	**0.2%**

Note: Household estimates are based on originally proposed 2006 LRDP. Number of households under currently proposed 2006 LRDP would be less. See text.

[a] Change in the number of households by place as projected by the ABAG in *Projections 2003.*
[b] The distribution of employees by place of residence is based on the characteristics of the Lab population described in Table IV.J-1.
[c] The analysis may overstate by a small amount the increase of Lab employee households in Berkeley and Albany because the estimate is based on place of residence data by zip code that also includes any employees who might live in Kensington in unincorporated Contra Costa County.
[d] For purposes of comparison to Bay Area household totals, this analysis conservatively combines the three percent of Lab employees living outside the Bay Area with the seven percent living in communities outside of Alameda, Contra Costa, and San Francisco counties.

SOURCE: Lawrence Berkeley National Laboratory; ABAG, *Projections* 2003; and Hausrath Economics Group.

The employee population growth under the proposed LRDP, in conjunction with housing supply constraints, are elements of an overall mismatch between housing supply and demand in Berkeley. That mismatch (or imbalance) contributes to housing market conditions characterized by low vacancies, high prices and rents relative to household incomes, and substantial competition for both existing housing and new units that come on the market. Those conditions have existed for some time in the City of Berkeley. While they are projected to continue under current land use policies, the new "smart growth" regional projections assume a loosening of constraints and implementation of local and regional policies and government financing incentives to encourage private investment that, over the longer term, would improve the balance of housing supply and demand in Berkeley and other central cities in the region. A mismatch between housing supply and demand in the city also means that people working in Berkeley who would like to live there, too, instead must seek housing elsewhere in the Bay Area or beyond the nine-county region. These choices would be more likely to the extent that the levels of housing production envisioned for Berkeley in the "smart growth" forecast were not realized. As described above, however, population growth and housing demand associated with the proposed 2006 LRDP would be dispersed over a number of communities in the region, based on place-of-residence trends among existing Lab employees. If housing options in Berkeley were constrained, the growth associated with the 2006 LRDP would not be concentrated in any particular area and therefore would not amount to a significant impact in any one community.

Impacts of Lab Guest Population

The number of guests using Lab facilities would increase under the proposed 2006 LRDP. There would be more guests on an annual basis and, potentially, more guests on any given day. The increase in guests would not induce growth in the permanent residential population and would not add to demand for permanent housing.

The proposed 2006 LRDP would increase the supply of overnight accommodations to serve the short-term needs of guests visiting from out of town. The Lab's proposed "User Guest House"[24] would consist of 120 beds providing short-term over-night accommodations. After development of the User Guest House, the Lab would discontinue the leases on the five apartments in downtown Berkeley that have capacity to house 20 visiting researchers at any one time. Because the proposed User Guest House would not provide housing for permanent residents, it would not add to the City's housing supply or induce population growth in the City of Berkeley. The availability of the five downtown apartments after the Lab discontinues the leases would not induce substantial population growth.

Under the proposed 2006 LRDP, the number of Lab guests requiring overnight accommodations in nearby hotels and motels or the homes of Lab employees would increase, because the total number of guest researchers is expected to increase. However, development of the User Guest House would allow a higher percentage of guest researchers to take advantage of overnight accommodations provided by the Lab, thereby lessening this impact. At the same time, the apartments formerly leased by the Lab would be returned to the private housing market.

Mitigation: None required.

Project Variant. While the project variant would result in an increase in ADP on the Lab's main hill site, compared to the project as proposed, the variant would not change total Lab employment. Therefore, effects would be the same as those of the project as proposed.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to population and housing. For the reasons stated above, individual projects identified in the scenario would increase the Lab's permanent employment and Lab guest population, but would not induce substantial population growth in the City of Berkeley or

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[24] The User Guest House is a proposed three-story, approximately 25,000-gross-square-foot building that would hold up to 120 beds for visiting researchers and other guests of LBNL. An Initial Study/Negative Declaration is expected to be prepared and circulated in 2007.

elsewhere in the region, either directly or indirectly. For the reasons stated above with regard to full implementation of the LRDP, this impact would be less than significant.

IV.J.3.4 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR) and Bay Area population growth as forecast by ABAG, and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects), along with implementation of the proposed LBNL 2006 LRDP. Projects currently under way at UC Berkeley, described in Section VI.C of this EIR, are accounted for in the cumulative analysis.

The geographic context for this cumulative analysis includes the San Francisco Bay Area. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.J-11) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact POP-2: The proposed LRDP, in conjunction with the proposed UC Berkeley 2020 LRDP and other projects that could be developed in Berkeley, would induce population growth in the City of Berkeley and the Bay Area, but the contribution of the 2006 LRDP to this impact would not be cumulatively considerable. (Less than Significant)

As noted in the Setting, LBNL is one of the largest employers in Berkeley, and by far the greatest number of Lab employees live in Berkeley or the immediate vicinity. Accordingly, growth in Berkeley (including at UC Berkeley) is the focus of the cumulative analysis.

In addition to the population growth associated with the proposed LBNL LRDP, other future growth would contribute to existing population and housing totals. This future growth could be accommodated through both new development and through changes in the occupancy and use of existing housing and other building space. The City of Berkeley and ABAG have prepared estimates of existing population, jobs, and housing, as well as projections of expected future increases in population, jobs, and housing.

As part of the environmental review for its General Plan Update in 2001, the City of Berkeley prepared estimates for 2000 and projections of growth through 2020 in the city under the new General Plan policies. City staff projected an increase of about 3,200 households in the city between 2000 and 2020 and a total population of about 116,000 in 2020 – about the same number of people that lived in Berkeley in 1970.

ABAG has prepared two sets of projections (*Projections 2002* and *Projections 2003*) that rely on the updated General Plan for overall citywide planning parameters.[25] Both of these ABAG scenarios for the City of Berkeley show more housing and population growth in the city than do the projections prepared by Berkeley staff for use in the 2001 General Plan EIR. As noted above, *Projections 2003* presents a longer-term scenario for enhanced housing production in Berkeley and other cities central to the region based on assumptions of supportive local and regional development and investment policies and substantial public financial investments to encourage housing production. The City of Berkeley has indicated that ABAG's "Smart Growth" *Projections 2003* (adjusted for 2000 Census group quarters enumeration errors) represent an appropriate baseline projection for Berkeley, reflecting the adoption of the new General Plan.[26]

The originally proposed 2006 LBNL LRDP projects an increase of about 1,000 jobs. (As noted earlier, the currently proposed LRDP would result in a smaller increase – about 900 jobs. The impact analysis regarding population growth is based on the more conservative employment projections associated with the original proposal.). The UC Berkeley 2020 LRDP could result in an increase of 2,870 faculty and staff working in the Campus Park and adjacent blocks and an increase in 1,650 students (UC Berkeley, 2004, Table 4.10-2).[27,28] In addition, an important objective of the UC Berkeley 2020 LRDP is increasing the housing supply near campus for students, faculty, and staff. Under the UC Berkeley 2020 LRDP, there could be an additional 2,600 beds of housing added within one mile of the center of campus. It is likely that most of this housing would be developed in the city of Berkeley (UC Berkeley, 2004: Table 3.1-3).

Many students, faculty, and staff prefer to live in Berkeley close to the campus. Therefore, the employment and enrollment growth associated with the two LRDPs, in conjunction with other projected population growth, would represent substantial cumulative population growth and a concentration of population in the City of Berkeley. The employee population growth associated with the proposed 2006 LBNL LRDP would contribute to this cumulative impact; however, as discussed further under Impact J.1, increases in population growth associated with the implementation of the LRDP would represent about two percent of the total number of people projected to be living in the Berkeley and Albany in 2025, and less than one percent of total projected population in 2025 in all other places of residence. Housing demand associated with implementation of the LRDP could account for less than one percent of the total increase in households projected for most communities where LBNL employees live. In Berkeley and Albany, Lab employee households could represent 5.7 percent of the increase expected between 2000 and 2025, and in Lafayette, Moraga, and Orinda, Lab employee households would represent about 1.6 percent of the expected increase in households. These increases under the LRDP

[25] The ABAG projections of population and employment for Berkeley do not explicitly account for either the proposed 2005 LBNL LRDP or the proposed UC Berkeley 2020 Long Range Development Plan (LRDP). Neither is an adopted plan that would be reflected in ABAG's local development policy database, and only preliminary information was available at the time ABAG prepared these projections. (Brian Kirking, Senior Regional Analyst, ABAG, personal communication, November 3, 2003.)

[26] City of Berkeley letter to Jennifer Lawrence, Environmental and Long Range Programs Manager, UC Berkeley, July 10, 2003.

[27] All population and employment estimates are expressed in terms of headcount.

[28] The EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) found that those projects would not result in any adverse impacts related to population, and thus the SCIP would not contribute to any cumulative impacts (UC Berkeley, 2006).

represent a less-than-significant impact under existing conditions, and therefore would not be considered a cumulatively considerable contribution to potential population and housing impacts.

The City of Berkeley General Plan EIR analyzed roughly comparable levels of employment and population growth in the city and policies that encourage housing production and population growth. The EIR concluded that resultant improvements to the city's jobs-housing balance would not result in adverse physical environmental impacts but would instead have a beneficial effect on housing conditions in the city.[29]

The housing market effects of increased demand due to population and employment growth relative to housing supply would be mitigated to some extent if the higher levels of housing production envisioned in the *Projections 2003* smart growth scenario were actually realized. The university-related housing production anticipated in the UC Berkeley 2020 LRDP could be part of this citywide scenario of increased housing supply. At the same time, more housing production would lead to greater concentration of population in the city. As noted above, the City of Berkeley General Plan EIR found that such a concentration of population in Berkeley would result in a net benefit both to the city and to the region as a whole.[30]

In light of the above, the 2006 LBNL LRDP would not contribute to cumulative adverse effects with regard to population or housing.

Mitigation: None required.

Project Variant. As already noted, the project variant would result in impacts substantially similar to the population and housing impacts that would result from the 2006 LRDP development. The cumulative population and housing impacts of the project variant would therefore be less than significant as described above.

Individual Future Project/Illustrative Development Scenario. For the reasons stated above regarding full implementation of the 2006 LRDP, future projects under the LRDP such as conceptually portrayed in the Illustrative Development Scenario, including the User Guest House, could induce population growth in Berkeley and the Bay Area when considered in conjunction with the proposed UC Berkeley 2020 LRDP and other projects that could be developed in Berkeley, but would not contribute considerably to cumulative adverse effects on population or housing.

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29 City of Berkeley, *Berkeley Draft General Plan EIR*, February 2001, page 66.
30 City of Berkeley, *Berkeley Draft General Plan EIR*, February 2001, page 308.

IV.J.4 References – Population and Housing

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IV.K. Public Services and Recreation

IV.K.1 Introduction

This section addresses the impact of the proposed 2006 LRDP on the provision of public services, including fire protection, police protection, public schools, and parks. This section focuses on the effects the proposed 2006 LRDP may have on the ability of public service providers to effectively deliver these services to the project site and vicinity, and whether an increase in demand for these services would require additional facilities that themselves would have an adverse environmental impact.

IV.K.2 Setting

IV.K.2.1 Fire Protection Services

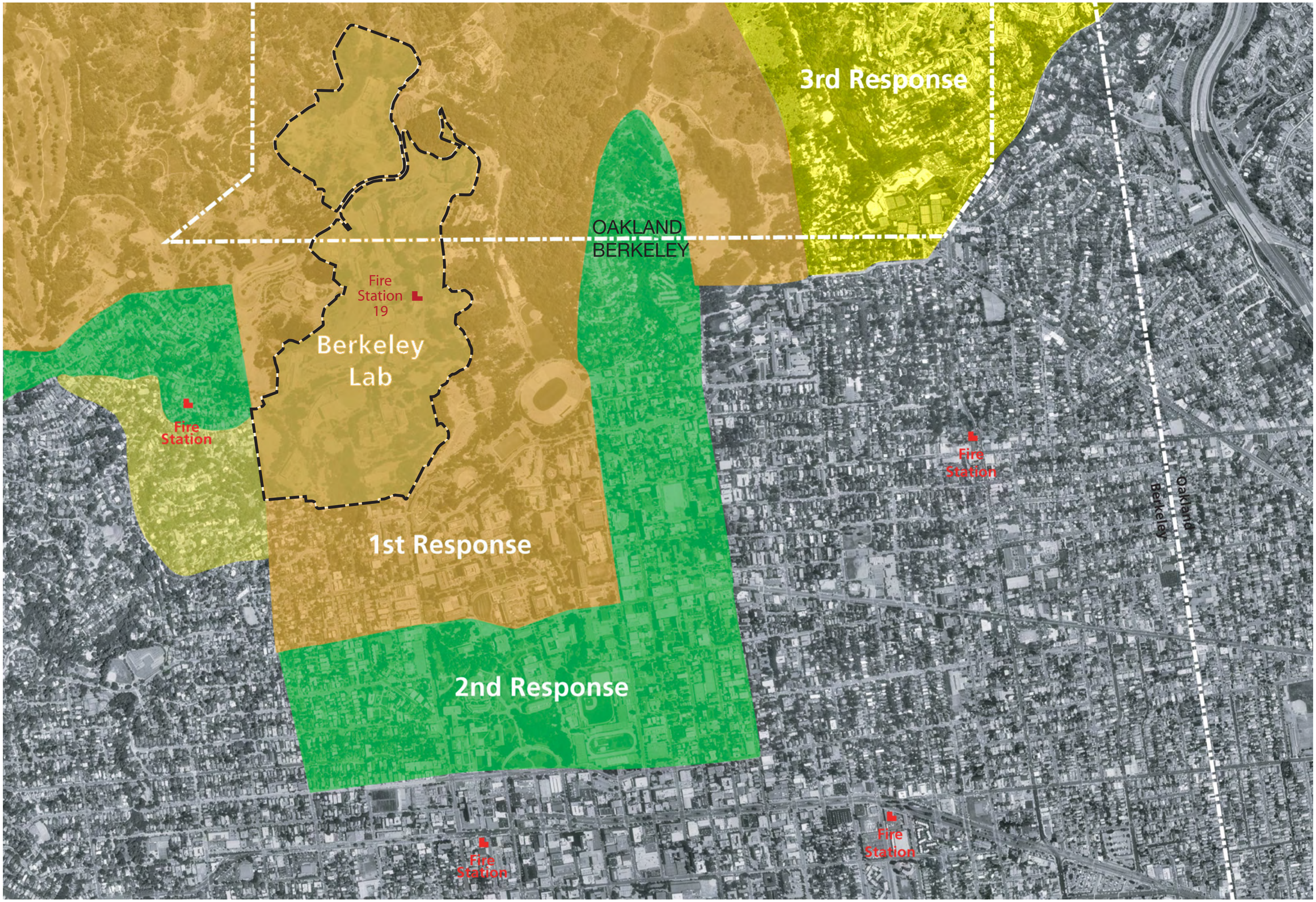
Alameda County Fire Department Services

LBNL is provided with firefighting services through contract services with the Alameda County Fire Department, which staffs a fire station located on the LBNL grounds. This station, which is Alameda County Station 19, is located at LBNL Building 48 and staffed 24 hours per day. Equipment at Station 19 includes one fire engine, one reserve fire engine, a hazardous materials vehicle, and a light-duty four-wheel drive "brush patrol unit" that can be used for wildland fires.

Station 19 provides first response at the Berkeley Lab for both fire alarms and medical emergencies. All station personnel are trained as Emergency Medical Technicians and at least one of the staff is a trained paramedic. In addition, there is one trained paramedic on the fire staff at all times.

LBNL and the City of Berkeley have worked collaboratively and developed an Automatic Aid Agreement, under which the Lab's fire department is the first responder for a portion of north Berkeley, including portions of the UC campus. The Berkeley Fire Department provides paramedic transport for LBNL; therefore, if a patient in a medical emergency requires transport to a hospital, a City of Berkeley ambulance responds at Berkeley Lab.

Station 19's service area extends outside the Berkeley Lab boundary to encompass the eastern portion of the UC Berkeley campus and areas in north Berkeley following the automatic aid agreement with the City of Berkeley (see Figure IV.K-1). Under this agreement, Station 19 responds to all fire and medical emergency calls within its service area, whether on or off the Berkeley Lab site. If the fire engine from Station 19 has been dispatched to a call and another alarm is received in Station 19's service area, the Berkeley Fire Department responds to the second call. The Alameda County Fire Department has mutual aid agreements with other communities, including the City of Oakland and the East Bay Regional Park District (EBRPD), which can be activated in the event of a major emergency. Mutual aid agreements allow Station 19 to respond to emergency calls in other jurisdictions if requested, if Station 19 is not already responding to another call. LBNL's telephone switch transfers all 911 (7911 from LBNL phones)



SOURCE: Lawrence Berkeley National Laboratory (2003)

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Figure IV.K-1
Fire Station 19 Automatic Aid District

calls from the main LBNL site to the Alameda County Regional Emergency Communications Center in Livermore. 911 calls from all LBNL off-site locations are sent to the corresponding "Public Safety Answering Points." The installation of "Enhanced 911" software has been completed; this allows emergency responders to accurately pinpoint the location of a caller, including building, floor, and telephone site.

The response time standard for Station 19 for LBNL calls is five minutes; most responses are made within four minutes. Approximately 25 percent of responses from Station 19 are to locations at the Berkeley Lab, about 40 percent of the calls are to the UC Berkeley campus, and the remaining calls are to locations within the City of Berkeley outside either LBNL or the Berkeley campus (LBNL, 2003c).[1] Between August 2002 and July 2003, there were approximately 129 calls to Fire Station 19 from LBNL, with approximately 21 percent of the calls for medical services, nine percent for hazardous materials-related incidents, two percent for fire services, and 40 percent for "other" incidents, while 28 percent were false alarms[2] (LBNL, 2003a).

Overall, the Alameda County Fire Department has 16 fire stations, with approximately 260 authorized firefighting personnel. However, all other Alameda County fire stations are well south (San Leandro, San Lorenzo, Castro Valley) or east (Dublin, Pleasanton, Livermore, Sunol) of the Berkeley Lab. In addition to firefighting, the department has specialized response teams for hazardous materials, urban search and rescue, and water rescue. The department also has an active reserve (volunteer) unit (Alameda County Fire Department, 2003).

City of Berkeley Fire Department Services

The City of Berkeley Fire Department has seven fire stations with seven engines, two ladder trucks, three ambulances, and specialized equipment including a hazardous materials vehicle. Each engine and truck is staffed with three firefighters, and each ambulance is staffed with two paramedics. The department has a total of approximately 140 employees, of whom about 130 are firefighters and paramedics. The department responds to some 12,000 calls over the course of the year, more than half of which are for medical emergencies and fewer than three percent of which are for fires, with the remainder being calls about hazardous materials, water problems, and false alarms (City of Berkeley, 2005). In 2000 there were 21 instances and, in 2001, 18 instances in which LBNL received automatic aid assistance from the Berkeley Fire Department (LBNL, 2003a).

The nearest City of Berkeley fire station to LBNL is located in downtown Berkeley about one block north of the intersection of Shattuck and University Avenues, two blocks west of the UC Berkeley campus, about one mile distant from LBNL. The City of Berkeley recently

1 While this analysis represents 2003 baseline data, more recent data are available: In 2005, with 578 total calls, Station 19 responded to 162 (28%) Berkeley Lab calls, 130 (23%) UC Berkeley campus calls, and 286 (49%) City of Berkeley calls.

2 "False Alarms" is considered a subjective term and is used in this analysis only to distinguish very generally between types of calls.

completed a new Hills Fire Station, the “Shasta” Berkeley Hills Fire Station, located at 3000 Shasta Road to replace an older station on Shasta Road that is a comparable distance from LBNL as the downtown Berkeley fire station (Lamphier-Gregory, 2002). The Hills Fire Station is designed to serve urban/wildland interface areas and meet the City’s established response time goal of four minutes. The new station houses three emergency response vehicles with space for reserve or auxiliary vehicles and sufficient accommodations for a regular three-person crew (or four persons, during periods of high fire danger) and a reserve crew of three firefighters.

City of Oakland Fire Department Services

The City of Oakland Fire Department operates 26 fire stations. The department currently includes 26 engine and seven ladder truck companies, with a minimum staffing of four personnel assigned to each engine and truck company. There are a total of approximately 500 firefighting personnel, including officers and investigators (Williams, 2003). Approximately 110 of Oakland’s firefighters are also trained as paramedics. The department is organized into four divisions and three battalions. While the divisions focus on department functions, the battalions, which are organized by geographical districts, provide requested fire and emergency medical services. Each battalion consists of seven to ten stations. Battalion 2 serves West Oakland and the North Oakland areas, including the part of the city that contains the far eastern and southeastern extent of LBNL. The closest City of Oakland fire station to the Berkeley Lab is located on Miles Avenue between College Avenue and Broadway, a distance of approximately three miles from LBNL.

Fire and medical emergency calls in City of Oakland are received by the public communications center at the police department. Calls are routed through a computer-aided dispatch system and announced over speakers in the fire station nearest the source of the call; directions are printed within 30 to 60 seconds. The department responded to a total of about 54,085 calls in 2002, ranging from structural fires (about 10 percent of the total calls) to medical emergencies (about 70 percent of total calls). The current citywide response time to fire and medical emergency calls is six minutes, 40 seconds. The department’s response goal is to respond to 90 percent of all calls in seven minutes or less (Williams, 2003). Structural fires are normally responded to with three engines, one fire truck carrying a 100-foot ladder, and 17 firefighters, including a battalion chief.

In addition to firefighting and emergency medical response capabilities, the fire department also has a hazardous materials unit that operates from Station 3, which is located at 1445 14th Street and responds to emergencies involving hazardous materials.

HAZMAT Emergency Response

The Lab has a contract with the Alameda County Fire Department that provides LBNL an “around-the-clock” engine company staffed by four Hazardous Materials Emergency Response (HAZMAT) certified firefighters. HAZMAT automatic aid is available through the Berkeley Fire Department or the Alameda County Fire Department. Depending on the magnitude of an incident, additional HAZMAT response support is available through the formal Fire Mutual Aid Plan, which the Alameda County Fire Department coordinates. An annual HAZMAT exercise is conducted with the appropriate Lab staff and the Alameda County Fire Department. Additionally, the Lab has an “around-the-clock” contract with a private vendor for HAZMAT clean-up.

Emergency Program

The Lab’s Master Emergency Program Plan (MEPP) establishes policies, procedures, and an organizational structure for responding to and recovering from a major disaster at LBNL. The LBNL MEPP (December 2005) uses the Standardized Emergency Management System (SEMS), as described by California Government Code 8607(a), for managing response to multi-agency and multi-jurisdiction emergencies in California. SEMS, adopted by California in 1995, incorporates the use of the Incident Command System (ICS), the Master Mutual Aid agreement, existing mutual aid systems, the County operational area concept, and inter-agency coordination. This system, by promoting the use of common terminology and command structure, facilitates better flow of information and coordination between responding agencies.

This plan also uses the National Incident Management System (NIMS), as prescribed by Homeland Security Presidential Directive-5 – Management of Domestic Incidents. NIMS is a nationwide, standardized approach to incident management and response that establishes a single, comprehensive system for incident management and cooperation among departments and agencies at all levels of government, from federal to local. Training is key to the success of this plan. Required training is tailored to meet the credible emergencies and focuses on skills required to execute this plan. All personnel assigned to the Emergency Response Organization will receive training appropriate to their level of participation – including SEMS/NIMS. This training includes an annual orientation to the Emergency Operations Center (EOC) and annual participation in exercises and drills. The program includes both individual and collective training, including classroom work, drills, and exercises, and may be conducted on- and off-site. Drills and exercises are an integral part of the LBNL emergency management program. They are conducted to provide emergency response training and to evaluate the Laboratory’s capability to respond effectively to an emergency. Analysis of the results from a drill or exercise provides the necessary information for improvement.

In an emergency, depending on the circumstances, employees could be advised to evacuate specific buildings or the entire site, or they could be advised to shelter-in-place. Situations could include a prolonged power outage, the threat of a wildland fire, release of a hazardous material, or a workplace violence incident. Responsibility for ordering a site-wide evacuation resides with any member of the LBNL Executive Team. Individual evacuation or shelter-in-place orders can be made by the EOC manager or a field incident commander. Instructions for routes to be used for a safe evacuation are given depending on the circumstances. Instructions for sheltering-in-place are distributed to all employees during the initial orientation.

Detailed information regarding LBNL’s emergency management and preparedness planning is available under the Lab’s Master Emergency Program Plan (LBNL/PUB-533 [2005]).

Vegetation Management Plan

During the late summer and early autumn, periodic strong off-shore winds moving from the Sierra Nevada Mountains are channeled up the Highway 24 corridor and sweep across the LBNL site and the immediate general area. These "Diablo" winds[3] desiccate vegetation, are characterized by low humidity, and can reach 60 miles per hour. The winds are particularly strong at the LBNL site and immediate area.

Diablo wind conditions are conducive to wildland fire ignition and the spread of ember-like fire-brands up to one mile in advance of a fire, resulting in frequent fast-moving wildland fires, including fires that destroy multiple buildings in the immediate general area of the Laboratory on average every ten years. After considering the inability of the traditional "defensible space" standard to protect Laboratory assets and examining options for increasing fire suppression staffing to taskforce levels, installing mechanical suppression units, and "hardening" buildings (all of which were determined to be not cost-effective and incapable of providing the necessary level of asset protection), the Laboratory adopted a program to manage vegetation to prevent wildland fire temperature and intensity (as the fire approaches and passes buildings) from becoming so severe that the fire can ignite the buildings.

Under the Laboratory's program, the intensity and flame height of an approaching firestorm is tempered as it enters the Laboratory's management area. Within the management area, ground fuels are managed annually so that they ignite and burn at low intensities (and do not permit fire to move into the crowns of trees), and buildings will not be threatened by ignition as low-intensity fire burns across the Laboratory site; the Laboratory site will be burned through, but it is anticipated that no assets will be lost under this program. Moreover, the lower flame heights produced by the managed fuels allow any available fire suppression personnel to work safely from the ground to extinguish the fire before it moves into the higher-fuel developed areas to the west of the Laboratory.

As described in Section IV.C, Biological Resources, LBNL actively manages vegetation over the entire site to minimize fire damage in the event of a major wildland fire. The Lab's vegetation management program integrates aesthetic, view, horticultural, and fire safety factors. Site-wide, vegetation, or wildland fire fuel, is managed to protect the Lab's buildings and workspaces during a worst-case Diablo wind-driven fire (winds similar to the 1991 Oakland Hills Fire) and any lesser wildland fire.

LBNL is a founding member of the Hills Emergency Forum and participates in multi-agency drills and roadside fuel-management exercises.

[3] Diablo winds are hot, dry offshore winds—flowing from land to shore, the opposite of the Bay Area's typical winds—that occur below canyons in the East Bay hills (Diablo range) due to high pressure over Nevada and lower pressure along the central California coast.

IV.K.2.2 Police Services

Police services at LBNL are provided through a contract with the UC Berkeley Police Department (UCPD), as well as with a private security provider responsible for outside security needs including Laboratory access, property protection and traffic control. The UCPD handles all patrol, investigation, and related law enforcement duties for UC Berkeley, LBNL, and other University-owned properties. UCPD operates 24 hours a day, seven days a week, coordinating closely with the City of Berkeley Police Department.

UCPD and the Oakland Police Department are members of the California Law Enforcement Master Mutual Aid Plan; all law enforcement agencies in the state belong to this plan to provide each other information and resources when needed. The Alameda County Sheriff’s Office is the Region II Law Enforcement Mutual Aid Coordinator. Additionally, the Lab has an annual renewable contract with UCPD that provides, when requested, law enforcement emergency response, limited patrols, criminal investigations, and VIP protection. UCPD and the Berkeley Police Department have an agreement regarding jurisdiction over off-site locations occupied by UC staff and Lab staff; this agreement is reviewed and updated annually. UCPD Community Services Officers are not assigned to the Lab. The Lab has no contract, memorandum of understanding (MOU), or similar agreement with Oakland Police Department.

UC Berkeley Police Department Staffing

The UCPD includes 77 police officers, 45 full-time non-sworn personnel, and 60 student employees. UCPD, located at 1 Sproul Hall on the UC Berkeley campus, has primary law enforcement jurisdiction on the campus of the University of California and associated University properties, including LBNL. UCPD is organized into four divisions: Administration, Community Outreach and Emergency Services, Investigative and Support Services, and Patrol. The department is empowered as a full-service state law enforcement agency pursuant to Section 830.2(b) of the California Penal Code and fully subscribes to the standards of the California Commission on Peace Officer Standards and Training. Officers receive the same basic training as city and county peace officers throughout the state, plus additional training to meet the unique needs of a campus environment.

There is no service ratio goal at the Lab; when services are requested or required, UCPD sends the appropriate resources to the Lab to address the situation and/or incident.

On-Site Security Staffing

The total on-site security staff at LBNL is approximately 34 personnel, who are divided into three to ten personnel per shift. Staffing and resources consist of an on-site portfolio manager, two to three roving patrols 24 hours per day and gate access at the Blackberry Canyon Gate 24 hours per day. The LBNL on-site security can respond to any accessible area of LBNL in less than five minutes. UCPD responds to LBNL as needed under the existing contract. The response time for UCPD is also less than five minutes (LBNL, 2003a). Generally, there are fewer than 25 calls annually from LBNL that require UCPD response and most of the calls are for routine events.

LBNL provides crime statistics in accordance with the "Cleary Act." Statistics for homicide, rape, assault, and robbery are zero for each category.

The LBNL personnel security strategy is to provide a two-tiered approach, which includes the services of contract, non-sworn protective personnel (private security company) and sworn police officers provided by the UCPD and, for off-site locations, the Berkeley Police Department, Oakland Police Department, and Walnut Creek Police Department. The LBNL physical security strategy uses a variety of intrusion-alarm devices in its various areas. Output signals from these devices are sent directly to the Blackberry Canyon Gate dispatch center for response by a security officer.

Site Access Controls

LBNL has a perimeter fence with three vehicle entrance points. Access is controlled at the Laboratory gates by protective personnel who visually inspect entering vehicles, checking for proper access authorization for the vehicle and occupant(s). One gate is always open. Two other gates are open at high-demand times during the normal work week. Vehicles may be searched randomly. Access control for areas within the Laboratory perimeter is done by hardware lock-and-key sets at critical doors and by an electronic system pre-coded to permit entry only to authorized card holders to those areas protected by the system.

IV.K.2.3 Schools, Parks, and Recreation

As further described in Section IV.J, Population and Housing, places of residence for Berkeley Lab employees are distributed throughout Bay Area communities, with a substantial number of employees (90 percent) living in Alameda and Contra Costa counties. Approximately 35 percent of Lab employees live in the cities of Berkeley, Albany, and Kensington and a combined 14 percent of Lab employees live in Oakland, Piedmont, and Emeryville. Another 30 percent of Lab employees live in Contra Costa County, primarily in nearby El Cerrito, Richmond, and San Pablo, and east of the Lab along Highway 24. Public schools, parks, and recreation are discussed specifically for the City of Berkeley because of the considerable percentage of Lab employees who live in the city. To be conservative, these public services are also evaluated for the City of Oakland, assuming the entire 14 percent of LBNL employees in Oakland, Piedmont, and Emeryville actually live in Oakland. Public schools, parks and recreation are not discussed for other cities and towns in the Bay Area and elsewhere, because the percent and number of Lab employees living in these areas is relatively small, and thus the associated effects on public services would be negligible.

Public Schools

Berkeley Unified School District

The Berkeley Unified School District (BUSD) operates 20 schools throughout the City of Berkeley: four early childhood education locations, 11 elementary schools (kindergarten-grade 5), three middle schools (grades 6-8), one high school (grades 9-12), and one adult school (BUSD, 2004a). Total enrollment for elementary and secondary schools for the 2003-2004 academic year was

8,843 students, consisting of 3,842 elementary school students, 1,893 middle school students, and 3,108 high school and continuation school students. Enrollment for the 2003-2004 academic year was less than the total enrollment in the BUSD for the 2002-2003 and 2001-2002 academic years, which were 9,060 and 9,427 students, respectively (California Department of Education, 2005a).

The BUSD conducted a facilities study to provide information regarding physical capacity for its schools. The study evaluated enrollment for the 2001-2002 academic year and found that elementary schools were operating at 86 percent of capacity, middle schools at about 61 percent of capacity, and the high school at about 67 percent of capacity. Since a peak in student enrollment in the 1999-2000 academic year, overall student enrollment has been declining for all grades, kindergarten through high school. Projections through the 2006-2007 academic year estimate a continued decline in student enrollment in BUSD schools (BUSD, 2004b).

Oakland Unified School District

The Oakland Unified School District (OUSD) operates the public school system within the Oakland city limits. The OUSD administers 64 elementary schools, 14 middle schools, and six high schools. It is also responsible for 16 charter schools (all grade ranges), five adult education centers, 20 alternative schools, four special education schools, eight “autonomous small schools,” and 39 child care centers. Total school enrollment for elementary and secondary students for the 2003-2004 academic year was 50,437, showing a decline in enrollment from 52,501 students in 2002-2003 and 53,545 students in 2001-2002 (California Department of Education, 2005a).

Private Schools

On a statewide basis, an estimated 11 percent of all kindergarten through grade 12 students attend private school. During the 2003-2004 academic year, more than 29,000 kindergarten through grade 12 students in Alameda County attended private schools, approximately 13 percent of the school population. There are 17 private elementary and secondary schools and a number of private colleges and institutions in the City of Berkeley. For the 2003-2004 academic year, the number of elementary and secondary school students in private school in Berkeley was 2,659. In the City of Oakland, there are 55 private elementary and secondary schools, attended by more than 9,000 students located throughout Oakland (California Department of Education, 2005b). These students do not necessarily live within the city of the private school. In addition, students living within Berkeley or Oakland can attend private schools in other cities. Private schools within Berkeley and Oakland provide a wide range of options that include Montessori schools, schools sponsored by religious institutions, and college preparatory schools.

Student Generation Rates

The California State Department of Education has developed student generation rates that are routinely used by school districts that have not developed their own rates. The state’s student generation rates are a result of statewide sampling and include areas that vary demographically. The State Department of Education estimates that one dwelling unit would generate an average of 0.7 student per unit: 0.5 elementary or middle-school student and 0.2 high school student (Yeager, 2004).

The BUSD does not have an adopted student generation rate to estimate the number of school-age children that could be generated by new residential development (City of Berkeley, 2002 and Copeland, 2004). The OUSD employs the student generation rates developed by the California State Department of Education.[4] Thus, the analysis of potential effects on public schools within the BUSD and the OUSD relies on the state student generation rate.

Parks and Recreation

Regional Open Space

The East Bay Regional Park District (EBRPD) manages over 95,000 acres within Alameda and Contra Costa counties, including 65 regional parks, recreation areas, wilderness, shorelines, preserves, and land bank areas. EBRPD regional park properties within the vicinity of the Lab hill site include Tilden Park and the Claremont Canyon Preserve that border the eastern Berkeley city limits. These regional parks are used extensively by Berkeley residents and provide open space and recreation facilities, including picnic areas, bicycle trails, swim areas, and environmental education centers. The EBRPD also has purchased a 170-acre area along Berkeley's waterfront that has become part of the East Bay Shoreline Park. Within Oakland's city limits, EBRPD provides open space and recreational facilities, including the 271-acre Leona Canyon Regional Open Space Preserve, the 1,220-acre Martin Luther King, Jr. Regional Shoreline Park, the 660-acre Robert Sibley Volcanic Regional Preserve, and the 100-acre Roberts Regional Recreational Area.

City of Berkeley

The City of Berkeley's Parks, Recreation and Waterfront Department manages the city's parks and open space. The city has 243 acres of City-owned and/or maintained parks and open space throughout Berkeley, excluding the 99-acre Aquatic Park. There are 52 parks providing traditional activities such as athletic fields, swimming pools, and tennis and basketball courts, as well as numerous tot and school-age play areas, community gardens, rock climbing, and a variety of water sports at the Berkeley Marina. The City of Berkeley maintains the parks-to-population ratio of 2.0 acres of parkland per 1,000 persons that was established in the 1977 City of Berkeley Master Plan (City of Berkeley, 2002).

Other UC Property

UC Berkeley manages parks and athletic and recreational facilities that serve the university and the wider community. The University also owns the 2.3-acre People's Park located south of the UC Berkeley campus. Athletic and recreational facilities are located within the central campus and also within the Strawberry Canyon Recreation Area. Additional resources include the Ecological Study Area.

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[4] The OUSD uses the statewide average student yield factors as defined in Section 1859.2 of the State Allocation Board Regulations.

City of Oakland

The City of Oakland's Office of Parks, Recreation and Cultural Affairs manages the city's parks and recreation centers. According to the Open Space, Conservation and Recreation (OSCAR) Element of the Oakland General Plan, an estimated 3,073 acres of total parklands are available within Oakland's city limits, providing about 8.26 acres of parkland per 1,000 residents; local-serving parks provide an estimated 1.33 acres per 1,000 residents. Oakland's per capita standards for parks identified in the OSCAR Element are based on National Recreation and Park Association guidelines, "with modifications made to reflect the fact that Oakland is a mature, relatively dense city with a limited supply of vacant land." The City of Oakland does not have a standard for parks associated with employment growth. For residential land use, the OSCAR Element uses a level of service standard of 10 acres of parkland and 4 acres of local-serving parks per 1,000 residents to determine where there are unmet needs and to set priorities for future capital investments (City of Oakland, 1995).

Oakland's parks are categorized by size and intended service area. The park categories include region-serving parks that are 25 acres or larger, community parks, and neighborhood parks. Oakland also has several classifications of miniparks, which are generally less than one acre in size. There are about 16 active miniparks, located primarily in the West Oakland, Fruitvale, and Elmhurst Planning Areas.

IV.K.2.4 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies contained in the Berkeley and Oakland General Plans.

Berkeley General Plan

Berkeley General Plan policies relevant to the proposed 2006 LRDP with regard to public services include the following:

> Policy LU-15. Ensure that neighborhoods are well served by basic goods, a diverse supply of community care, services and facilities, including park, school, child care, and church facilities; fire, police, and refuse collection services; and by existing neighborhood commercial areas.

Fire Protection Services

Berkeley General Plan policies pertaining to fire protection include:

Policy S-21 Fire Preventive Design Standards. Develop and enforce construction and design standards that ensure that new structures incorporate appropriate fire prevention features and meet current fire safety standards.

Actions:

A) Develop proposals to make developed areas more accessible to emergency vehicles and reliable for evacuation. Consider restricting on-street parking, increasing parking fines in hazardous areas, and/or undergrounding overhead utilities. Require that all private access roads be maintained by a responsible party to ensure safe and expedient passage by the Fire Department at any time, and require approval of all locking devices by the Fire Department. Ensure that all public pathways are maintained to provide safe and accessible pedestrian evacuation routes from the hill areas.

B) Evaluate existing access to water supplies for fire suppression. Identify, prioritize, and implement capital improvements and acquire equipment to improve the supply and reliability of water for fire suppression. Continue to improve the water supply for fire fighting to assure peak load water supply capabilities. Continue to work with EBMUD to coordinate water supply improvements. Develop aboveground (transportable) water delivery systems.

C) Provide properly staffed and equipped fire stations and engine companies. Monitor response time from initial call to arrival and pursue a response time goal of four minutes from the nearest station to all parts of the city. Construct a new hill area fire station that has wildland fire fighting equipment and ability.

Policy S-22 Fire Fighting Infrastructure. Reduce fire hazard risks in existing developed areas.

Policy S-23 Property Maintenance. Reduce fire hazard risks in existing developed areas by ensuring that private property is maintained to minimize vulnerability to fire hazards

Policy S-24 Mutual Aid. Continue to fulfill legal obligations and support mutual aid efforts to coordinate fire suppression within Alameda and Contra Costa Counties, Oakland, the East Bay Regional Park District and the State of California to prevent and suppress major wild land and urban fire destruction.

Policy EM-31 Landscaping. Encourage drought-resistant, rodent-resistant, and fire-resistant plants to reduce water use, prevent erosion of soils, improve habitat, lessen fire danger, and minimize degradation of resources.

Police Services

The Berkeley General Plan does not identify policies regarding police services.

Schools, Parks, and Recreation

Berkeley General Plan policies related to schools, parks, and recreation include:

> Policy LU-40. Continue to support maximum opportunities for citizen use of libraries and recreational facilities, the maintenance of the hill lands as open space and the adoption of campus development standards and policies to conserve and enhance present open space resources.

> Policy OS-4 Working with Other Agencies. Work with the Berkeley Unified School District, the University of California, the East Bay Municipal Utility District, and the East Bay Regional Park District to improve, preserve, maintain, and renovate their open space and recreation facilities.

Oakland General Plan

The Oakland General Plan Land Use and Transportation Element (LUTE) was approved in March 1998, and the Open Space, Conservation and Recreation (OSCAR) Element was approved in 1995 (City of Oakland, 1998a and 1995). In addition to policies included in the Oakland General Plan, and listed below, the EIR for the LUTE included mitigation measures to reduce potential impacts on public services to a less-than-significant level. The mitigation directs the City to consider the availability of public services (police and fire protection services, park and recreation services, and schools) in the affected areas as well as the project's impact on current service levels (City of Oakland, 1998b). General Plan policies relating to public services include the following.

Fire Protection Services

Oakland General Plan policies pertaining to fire protection include:

> LU Policy N13.1. The development of public facilities and staffing of safety related services, such as fire stations, should be sequenced and timed to provide a balance between land use and population growth and public services at all times. (LUTE)

> Policy CO-10.2. As determined necessary by the City, require individual property owners and developers in high hazard areas to reduce fire hazards on their properties through a range of preventative measures. Landscaping and site planning in these high hazard areas should minimize future wildfire hazards. (OSCAR Element)

Police Services

Oakland General Plan policy regarding police services includes LU Policy N13.1 (see above).

Schools, Parks, and Recreation

The Oakland General Plan does not contain policies regarding schools. General Plan OSCAR Element policies related to parks and recreation include:

> Policy REC-3.1. Use level of service standards of 10 acres of total parkland and 4 acres of local-serving parkland per 1,000 residents as a means of determining where unmet needs exist and prioritizing future capital investments.

Policy REC-3.2. Follow a systematic process in allocating park and recreation funds. In general, allocate the greatest expenditures to those areas with the greatest unmet needs and place a priority on projects that maximize reductions in deficiency for the amount of money spent. However, maintain the flexibility to consider such factors as site opportunities, the availability of grants or matching funds, and linkages to other kinds if projects.

Policy REC-3.3. Consider a range of factors when locating new parks or recreational facilities, including local recreational needs, projected operating and maintenance costs, budgetary constraints, surrounding land uses, citizen wishes, accessibility, the need to protect or enhance a historic resource, and site visibility.

Policy REC-4.1. Provide for ongoing, systematic maintenance of parks and recreational facilities to prevent deterioration, ensure public safety, and permit continued public use and enjoyment.

Policy REC-6.1. Promote joint use agreements and similar arrangements between the City, the Oakland Unified School District, and other public agencies to maximize the use of school and other non-park recreational facilities during non-school hours.

Policy REC-6.2. Encourage public-private partnerships as a means of providing new recreational facilities on privately-owned sites. Promote joint use partnerships with local churches, private recreational service providers, and local non-profits.

Policy REC-6.3. In areas where park deficiencies exist, pursue recreational use of open space at surplus schools, military bases, utility and watershed properties, and transmission and transportation corridors. Recreational uses in such locations should not conflict with the functional use of the property and should be compatible with prevailing environmental conditions.

Policy REC 7-1. Provide diverse recreational activities for all ages, with a progression of programs from youth to adulthood. Equitably distribute programs throughout all Oakland neighborhoods.

Policy REC-10.1. Continue to provide General Fund support for park and recreational services, acknowledging the importance of these services to the quality of life in Oakland.

Policy REC-10.2. To the extent permitted by law, require recreational needs created by future growth to be offset by resources contributed by that growth. In other words, require mandatory land dedication for large scale residential development and establish a park impact fee for smaller-scale residential development, including individual new dwelling units. Calculate the dedication or fee requirement based on a standard of four acres of local-serving parkland per 1,000 residents.

Policy OS-2.5. Increase the amount of urban parkland in the seven flatland planning areas, placing a priority on land in areas with limited public open space, land adjacent to existing parks, land with the potential to provide creek or shoreline access, land with historical or visual significance, land that can be acquired at no cost or reduced cost, land in areas with dense concentrations of people or workers, and land that is highly visible from major streets or adjacent to public buildings.

IV.K.3 Impacts and Mitigation Measures

IV.K.3.1 Significance Criteria

The impact of the 2006 LRDP on public services and recreation would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the CEQA Guidelines and the UC CEQA Handbook:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or result in the need for new or physically altered governmental facilities, the construction[5] of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives for any of the following public services:
  - Fire protection;
  - Police protection;
  - Schools;
  - Parks; or
  - Other public services.
- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

IV.K.3.2 Impact Assessment Methodology

The environmental impact analysis for public services in this EIR involves an assessment of existing public service standards and capacity. As necessary, respective public service providers were contacted for information on existing conditions as well as for their assessment of potential project impacts. The public service demands were then calculated and compared to existing service capacity, and the additional resources that would be required to maintain or meet existing service standards identified.

In addition to providing the environmental impact analysis for the LRDP, the analysis in this EIR will be used in connection with later approvals of specific activities pursuant to the LRDP. The Lab will evaluate the public service and recreation impacts of any later activity implemented pursuant to the LRDP and compare those impacts with the evaluation in this program EIR to determine the appropriate level of any further CEQA review that may be required before approval of the later activity. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3).

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5 For the purposes of this EIR, the term “construction,” unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

IV.K.3.3 2006 LRDP Principles, Strategies, and LBNL Design Guidelines

2006 LRDP Principles and Strategies

The 2006 LRDP proposes four fundamental principles that form the basis for the development strategies provided for each element of the LRDP. The principle most applicable to the public services and recreational aspect of new development is to "Build a safe, efficient, cost effective scientific infrastructure capable of long-term support of evolving scientific missions."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP (see Chapter III, Project Description for further discussion, and see Appendix B for a full listing of principles, strategies and design guidelines). Development strategies set forth in the 2006 LRDP that are applicable to public services and recreation include the following:

- Configure and consolidate uses to improve operational efficiencies, adjacencies and ease of access;
- Increase development densities within the most developed areas of the site to preserve open space, enhance operational efficiencies and access;
- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates; and
- Develop all new landscape improvements in accordance with the Laboratory's vegetation management program to minimize the threat of wildland fire damage to facilities and personnel.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LDRP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The document provides the following specific planning and design guidance relevant to the public services and recreational aspects of new development:

- Provide appropriate Site Lighting for safety and security; and
- Design all new streets to accommodate two-way traffic flow and pedestrian access.

IV.K.3.4 Impacts and Mitigation Measures

Impact PUB-1: The proposed project would result in an increase in demand for fire protection services. However, this increased demand would not result in the need for additional facilities for fire protection services. (Less than Significant)

The Lab's fire protection services are provided on a contract basis. During the span of the 2006 LRDP, LBNL would continue its contract to ensure equipment, materials and training are sufficient to maintain fire protection service levels at the Lab. The Alameda County Fire Department's Fire Station 19, located in Building 48 at the Lab's hill site, responds to calls at the Lab, UC Berkeley and other off-site locations, generally within the City of Berkeley. Currently, most of the Fire Station 19 responses are to locations outside of the Lab including UC Berkeley and other off-site locations, while the Berkeley Fire Department responds to the LBNL hill site less than twice a month. The proposed 2006 LRDP would increase the Adjusted Daily Population (ADP) at the LBNL hill site by approximately 27 percent (23-percent overall increase in ADP) to approximately 4,650 ADP, and increase the on-site building square footage by slightly more than 37 percent. Based on current patterns of demand for fire protection services at LBNL, implementation of the 2006 LRDP would result in about three to five additional calls per month, of which one or fewer would require response by the Berkeley Fire Department. Additionally, all new structures built on the hill site would comply with applicable building and fire code requirements, and DOE standards, which would include, for example, the installation of automatic fire-sprinkler systems. Subsequent development projects resulting from implementation of the proposed LRDP would occur within the Lab boundary and would not extend into the adjacent wildland areas, meaning that the project would not be anticipated to increase the number or intensity of potential wildfires. While implementation of the 2006 LRDP would result in the development of new structures in an area prone to wildfires, the applicable building standards for new projects and ongoing fuel management at LBNL would result in a less-than-significant impact on demand for fire services.

Based on the current and expected demand for fire protection services and discussion with the Alameda County Fire Department, it is not anticipated that implementation of the 2006 LRDP would result in the need for new facilities, staff or equipment to provide adequate fire protection (Piermattei, 2006). The number of calls handled by Station 19 at LBNL is relatively light in comparison with typical Alameda County and Berkeley fire stations. The Alameda County Fire Department handles about 21,000 calls per year with 17 stations and Berkeley handles about 12,000 calls per year with seven stations. An average Alameda County station handles about 100 calls per month and an average Berkeley station handles about 140 calls per month. Station 19 at LBNL handles about 50 to 60 calls per month, which is only about 40 percent to 60 percent of the Berkeley and Alameda County averages, respectively. With the implementation of the 2006 LRDP, the Alameda County Fire Department expects that the additional staff and buildings would result in about an additional three to five more calls per month. This small increase in the number of calls related to the implementation of the 2006 LRDP could be accommodated without additional staff or facilities. Therefore the impact would be less than significant.

Mitigation: None required.

Project Variant. The project variant would result in an increase in ADP of an additional 350 persons at the hill site, approximately 30 percent more than the proposed increase under the proposed LRDP. The additional LBNL staff would be consolidated from off-site locations and accommodated within the 2.42 million gsf (660,000 gsf new) of occupiable (research and support) building space on the hill site proposed under the 2006 LRDP.

The increase in the on-site population could increase calls for fire protection services. Based on current patterns of demand for fire protection services at LBNL, the project variant could result in about four to six additional calls per month, compared to existing conditions, or about one additional call per month above the anticipated demand under the 2006 LRDP. The project variant would not affect building compliance with applicable building and fire code requirements or the placement of new buildings.

This incremental increase in demand for fire protection services is not anticipated to result in the need for new facilities, staff, or equipment to provide adequate fire protection. Therefore, the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is conceptually portrayed in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to public services and recreation. Potential individual projects pursuant to the LRDP such as those identified in the Illustrative Development Scenario would not result in the need for additional fire protection facilities or services, for the reasons noted above. Therefore, the impact of such projects on fire protection services would be less than significant.

Impact PUB-2: The proposed project would result in an increase in calls for police services. However, this increased demand would not result in the need for additional facilities for police protection services. (Less than Significant)

The Lab's police services are provided through the UC Police Department (UCPD) and a private on-site security firm on a contract basis. The private security firm is responsible for on-site security needs including Laboratory access, property protection, and traffic control, and can respond to any accessible area of LBNL in less than five minutes. The UCPD responds to LBNL as needed under the existing contract, and the response time for UCPD is also less than five minutes (LBNL, 2003a). In the last 12 months, UCPD has responded to LBNL only once and generally there are fewer than 10 instances per year at LBNL that require response from UCPD.

Additionally, the "Cleary Act" statistics for homicide, rape, assault, and robbery are zero for each category at LBNL.

Implementation of the 2006 LRDP would increase the LBNL hill site ADP by approximately 27 percent (23-percent overall increase) and increase the on-site building square footage by slightly more than 37 percent. Assuming a conservative estimate, the number of responses from UCPD would increase from the historical average of 10 calls per year to, at most, 15 calls for year at buildout of the 2006 LRDP. The on-site security demand would also increase, and would be addressed in the contract for services to ensure adequate protection. Based on the estimated demand for police services and discussion with LBNL, it is not anticipated that implementation of the 2006 LRDP would result in the need for new facilities, staff, or equipment to provide adequate police services. Therefore the impact would be less than significant.

There is no memorandum of understanding/automatic aid agreement between LBNL and the City of Berkeley or City of Oakland police departments; each agency responds to the respective political sub-divisions for which they have jurisdiction. The Lab's law enforcement "calls for service" requiring a UCPD response are sufficiently low (approximately 15 to 25 per year) that the implementation of the LRDP is not expected to affect UCPD's or the private security company's ability to provide service under the respective contracts; no new facilities would be required (Lunsford, 2006).

Mitigation: None required.

Project Variant. The project variant would result in an increase in ADP of an additional 350 persons at the hill site, or 30 percent above the projected increase under the project description. The additional staff would be LBNL staff who would be consolidated from off-site locations and accommodated within the 2.42 million gsf of occupiable building space on the hill site proposed under the 2006 LRDP.

The increase in on-site population that would result from implementation of the project variant could increase calls for police services. Based on the historic average number of calls (approximately 10 calls per year), the project variant could increase the number of calls for police services by about five additional calls per year above the 15 calls estimated under buildout of 2006 LRDP. There would also be increased demand for on-site security, which would be addressed in the contract for services between LBNL and the private security provider, to ensure adequate protection for the on-site population.

This incremental increase in demand for police services is not anticipated to result in the need for new facilities, staff, or equipment to provide adequate police services. Therefore the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is conceptually portrayed in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to public services and recreation. Potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would not result in the need for additional facilities for police protection services and therefore the impact of such projects on police services would be less than significant, for the reasons noted above.

Impact PUB-3: Implementation of the 2006 LRDP would not result in the need for new or physically altered public school facilities. (Less than Significant)

The proposed project would not develop residential uses and therefore would not directly generate new student enrollment in the BUSD or OUSD (or other school districts). However, it is possible that people would relocate to the cities of Berkeley and Oakland as a result of new employment generated by implementation of the 2006 LRDP and their children would attend BUSD or OUSD schools. As further discussed in Section IV.J, Population and Housing, the existing residential distribution for LBNL employees is 35 percent of employees residing in Berkeley, Albany, and Kensington, and a conservatively estimated 14 percent residing in Oakland Piedmont and Emeryville. The proposed 2006 LRDP is anticipated to increase the overall LBNL ADP by 27 percent. Assuming the existing residential distribution would apply to the increased ADP resulting from the 2006 LRDP, the project would result in an increase of approximately 350 households in Berkeley and 140 households in Oakland. This assumes an estimated one employee per household.

Using student generation rates of 0.7 student per household from the State Department of Education, the proposed LRDP is anticipated to generate approximately 175 elementary or middle school children and 70 high-school-age students in Berkeley. This represents less than two percent of current enrollment. Based on the existing capacity in the BUSD schools, the elementary, middle, and high schools could accommodate the 245 new students that could indirectly result from implementation of the LRDP. In Oakland, the proposed LRDP could generate up to 70 elementary or middle school children and 28 high school-age students. This represents less than one quarter of a percent of the existing student enrollment in Oakland. It is likely that these new students introduced to the OUSD could be accommodated in existing school facilities and would not require the construction of new school sites.

Furthermore, the proposed LRDP would guide development at LBNL over a 20-year period. Increases in ADP, and also indirect contributions to student enrollment, would occur incrementally over this 20-year planning horizon, as new buildings are constructed to provide additional space on the hill site. School enrollment is affected by economic conditions and development, and it is currently unknown whether overcrowding in BUSD and OUSD would occur in the next 20 years. Overall student enrollment in elementary and secondary schools over the past three years in both the BUSD and OUSD has been declining.

The proposed project would not, by itself, induce a substantial or immediate population increase or result in a substantial increase in the demand for housing that would result in the need for new or physically altered public school facilities. The project would therefore have a less than significant impact.

Mitigation: None required.

Project Variant. The project variant would result in effects similar to those discussed above. The project variant would increase the ADP at the hill site above projections in the 2006 LRDP by the consolidation of existing LBNL staff from off-site locations. Because the project variant would not result in the generation of new employment opportunities above those analyzed as part of the 2006 LRDP, the project variant would not result in any new impacts related to public schools.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts to public services and recreation. Potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario would not result in the need for new or physically altered public school facilities and thus would not result in any significant impacts related to public schools, for the reasons noted above.

Impact PUB-4: Implementation of the proposed 2006 LRDP would not significantly adversely affect the provision of parks and recreation. (Less than Significant)

The City of Berkeley has a criterion for residential land use of 2.0 acres of parks per 1,000 persons established in the 1977 City of Berkeley Master Plan (City of Berkeley, 2002). The Oakland General Plan does not have a standard for parks associated with employment growth, although the City does have a level of service standard for residential land use of 10 acres of total parkland and 4 acres of local-serving parkland per 1,000 residents to determine where unmet needs exist and to set priorities for future capital investments. Currently, Oakland has a parkland ratio of 8.26 acres per 1,000 residents and a local-serving park ratio of 1.33 acres per 1,000 residents (City of Oakland, 1998b).

The proposed 2006 LRDP is anticipated to increase the overall LBNL ADP by 27 percent. Assuming that current residential trends for LBNL employees continue, approximately 35 percent

(350) of new LBNL employees would reside in Berkeley, resulting in an additional demand for 0.7 acre of parkland. Assuming that approximately 14 percent (140) of the new LBNL employees would be Oakland residents, the project could generate a demand for an additional 1.4 acres of parkland and an increase of 0.6 acres of local-serving parkland. The additional demand for park and recreation would be relatively small, compared to Berkeley's 243 acres of existing parkland and Oakland's 3,703 acres of parkland.

Implementation of the LRDP would not result in housing development, and thus the effect of the proposed LRDP on parks and recreation would be indirect, resulting from an increase in residential population to accommodate an increase in ADP at LBNL. Construction of new housing is anticipated in Berkeley, Oakland, and elsewhere in the next 20 years, based on current projections by the Association of Bay Area Governments, which are relied upon in the preparation of city and county general plans. Under the City of Berkeley and the City of Oakland planning process, planned residential uses in each city would be subject to the City's zoning ordinance and general plan policies. For residential development, levels of service for parks and recreation for each city are discussed in the paragraph above.

While significant environmental impacts from the development of parkland in urban areas are generally not anticipated, the environmental review processes of the cities of Berkeley and Oakland, and other jurisdictions, would ensure that environmental impacts associated with the development of residential projects and their demand for recreational facilities, as well as the development of recreational facilities themselves, are mitigated to the maximum extent feasible. It would be speculative to assume that there would be significant and unavoidable impacts from the development of parks or recreation facilities in the region. In summary, the effects on parks and recreation resources from the proposed project would be less than significant.

Mitigation: None required.

Project Variant. The project variant would result in effects similar to those discussed above. The project variant would increase the ADP at the hill site above projections in the 2006 LRDP by the consolidation of existing LBNL staff from off-site locations. Because the project variant would not result in the generation of new employment opportunities above those analyzed as part of the 2006 LRDP, the project variant would not result in any new impacts related to parks and recreation.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the potential buildings that is conceptually portrayed in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on demand for parks and recreation. Potential individual projects under the LRDP such as those identified in the Illustrative Development

Scenario would not adversely affect the provision of parks and recreation, for the reasons noted above; therefore the impact of such an individual project would be less than significant.

IV.K.3.5 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects [SCIP]) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex – housing the Bevatron accelerator – is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Certification of the Building 51 (Bevatron) EIR and approval of the demolition project are anticipated to be considered in early 2007. Additional projects currently underway at UC Berkeley, described in Section VI.C, Cumulative Impacts, of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis includes Berkeley Lab and areas proximate to the Lab within the cities of Berkeley and Oakland that rely on the same service providers as LBNL. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.K-15) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact PUB-5: Under cumulative conditions, implementation of the 2006 LRDP would contribute to an increase in demand for fire protection services and police services. However, this increased demand would not result in the need for new or physically altered facilities, the construction of which could cause significant environmental impacts. (Less than Significant)

As described in Impact PUB-1 above, Fire Station 19 at Berkeley Lab has a relatively low call volume compared to Berkeley or other Alameda County fire stations. Station 19 serves a fixed geographic response area that is relatively fully developed. While foreseeable development may cause that call volume to increase slightly, such incremental increases in demand for fire protection services can be accommodated without additional staffing or facilities. The call volume at Station 19 would have to more than double to approach the average call volume for a City of Berkeley fire station (Piermattei, 2006).

Reasonably foreseeable development in the East Bay could result in the increased need for new or altered fire protection or police facilities in the region. The City of Berkeley General Plan indicates the need for additional fire protection facilities and the City of Oakland General Plan indicates the need for expanded facilities or the seismic retrofit of existing facilities. However, as noted in Impacts PUB-1 and PUB-2, implementation of the 2006 LRDP would not result in the need for new facilities, staff, or equipment to provide adequate fire protection or police services. Therefore, the project's contribution to cumulative demand would not be cumulatively considerable. Furthermore, planned residential development in local jurisdictions where Berkeley Lab employees might live, such as the cities of Berkeley or Oakland, would be subject to the local agency's zoning ordinance and general plan policies, which would require that environmental impacts associated with new residential development are mitigated to the maximum extent feasible.

The EIR for the UC Berkeley SCIP identifies no significant impacts related to public services as a result of implementation of the Integrated Projects (UC Berkeley, 2006). The SCIP EIR concludes that neither emergency response and evacuation plans nor emergency access would be adversely impaired due to the Integrated Projects. In particular, "[t]he Integrated Projects, including expanded capacity use of [Memorial Stadium], would not result in inadequate emergency access to the Panoramic Hill neighborhood" (UC Berkeley, 2006; p, 4.7-14). Similarly, implementation of the LBNL 2006 LRDP would not result in any adverse effects on emergency access attributed to increases in traffic (see Section IV.L, Transportation). Therefore, implementation of the LRDP, alone or in combination with other past, present, and reasonably foreseeable future projects, would not result in a significant cumulative impact with regard to emergency access.

Mitigation: None required.

Project Variant. The project variant would result in public services and recreation impacts substantially similar to the public services and recreation impacts that would result from the 2006 LRDP development. The project variant's contribution to cumulative demand on fire and police protection services would not be considerable, nor would the project variant, either alone or in combination with other past, present, and reasonably foreseeable future projects, result in a significant cumulative impact with regard to emergency access, for the reasons noted above.

Individual Future Project Variant/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. The contribution of a future project under the LRDP such as identified in the scenario to cumulative demand on fire and police protection services would not be considerable, nor would such a future project, alone or in combination with past, present, and reasonably foreseeable future projects, result in a significant cumulative impact on emergency access, for the reasons stated regarding implementation of the LRDP.

Impact PUB-6: Under cumulative conditions, implementation of the proposed 2006 LRDP would not result in the need for new or physically altered public school facilities. (Less than Significant)

As discussed under Impact PUB-3, the 2006 LRDP would include no housing component, and therefore the effect of implementing the LRDP would be indirect; that is, any increased demand for school facilities would derive from residential development to accommodate increased ADP at the Lab. Because the 2006 LRDP would result in no direct impact on school facilities, and because the indirect effect would be minimal, implementation of the 2006 LRDP would not result in a considerable contribution to any cumulative increase in the demand for school facilities. Compared to existing student enrollment, the project would increase enrollment by less than three percent in the BUSD and less than one quarter of a percent in the OUSD. Under cumulative conditions, these percentages would decrease since both the Berkeley General Plan and Oakland General Plan provide for future residential and employment growth. Therefore, the proposed project would not result in a considerable contribution to the demand for school facilities that would result in the need for new or physically altered facilities under cumulative conditions. Furthermore, planned residential development in local jurisdictions where new Berkeley Lab employees might live, such as the cities of Berkeley or Oakland, would be subject to the local agency's zoning ordinance and general plan policies. Planned development may also be required to pay school impact fees that, under CEQA, are deemed as full and complete mitigation for effects on schools. Therefore, the project's cumulative effect on public school facilities would be less than significant.

Mitigation: None required.

Project Variant. The project variant would result in public services and recreation impacts substantially similar to the public services and recreation impacts that would result from the 2006 LRDP development. The project variant would not result in a considerable contribution to any cumulative increase in the demand for school facilities, for the reasons stated above, and therefore the impact would be less than significant.

Individual Future Project Variant/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. A future project under the LRDP such as conceptually portrayed in the scenario, when combined with other projects under the LRDP and other development, would also, for the reasons stated above, result in cumulative public school facilities impacts that would be less than significant.

Impact PUB-7: Under cumulative conditions, implementation of the proposed 2006 LRDP would not substantially affect the provision of parks and recreation facilities. (Less than Significant)

Implementation of the 2006 LRDP along with cumulative development could result in an increased demand for parks and recreation facilities in Berkeley and Oakland. As discussed under Impact PUB-4, however, the 2006 LRDP does not include any housing component, and therefore the effect of implementing the LRDP would be indirect; that is, any increased demand for park and recreation facilities would derive from new residential development to accommodate increased ADP at the Lab. As noted under Impact PUB-4, planned residential uses in each city (as well as in other local jurisdictions where Berkeley Lab employees might reside) would be subject to the local agency's zoning ordinance and general plan policies, which would require that environmental impacts associated with the development of parks and recreation facilities are mitigated to the maximum extent feasible. Because the 2006 LRDP would result in no direct impact on park and recreation facilities, and because any indirect effect would be minimal, implementation of the 2006 LRDP would not result in a considerable contribution to any cumulative increase in the demand for park and recreation facilities. Therefore, the cumulative impact would be less than significant.

Mitigation: None required.

Project Variant. The project variant would result in public services and recreation impacts substantially similar to the public services and recreation impacts that would result from development under the 2006 LRDP. The cumulative park and recreation facilities impacts of the project variant would therefore be less than significant as described above.

Individual Future Project Variant/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the LRDP. A future project under the LRDP such as conceptually portrayed in the scenario, when combined with other projects under the LRDP and other development, would also, for the reasons stated above, result in cumulative park and recreation facilities impacts that would be less than significant.

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IV.L. Transportation/Traffic

IV.L.1 Introduction

This chapter evaluates project impacts on transportation facilities and existing transportation operating conditions in the vicinity of the project area, including neighborhood traffic, vehicular circulation, parking, transit and shuttle services, and pedestrian and bicycle circulation.

IV.L.2 Setting

LBNL is located close to three major highways: Interstate 80/580[1] approximately three miles to the west, and State Routes (SR) 24 and 13, two miles to the south. Access from the Lab to I-80/580 is through the city of Berkeley via arterial roads. Access to SR 24 and SR 13 is via Tunnel Road. Grizzly Peak Boulevard, which runs through a largely undeveloped area, provides a minor local access route. Berkeley Lab is approximately one mile from the Bay Area Rapid Transit (BART) station in downtown Berkeley.

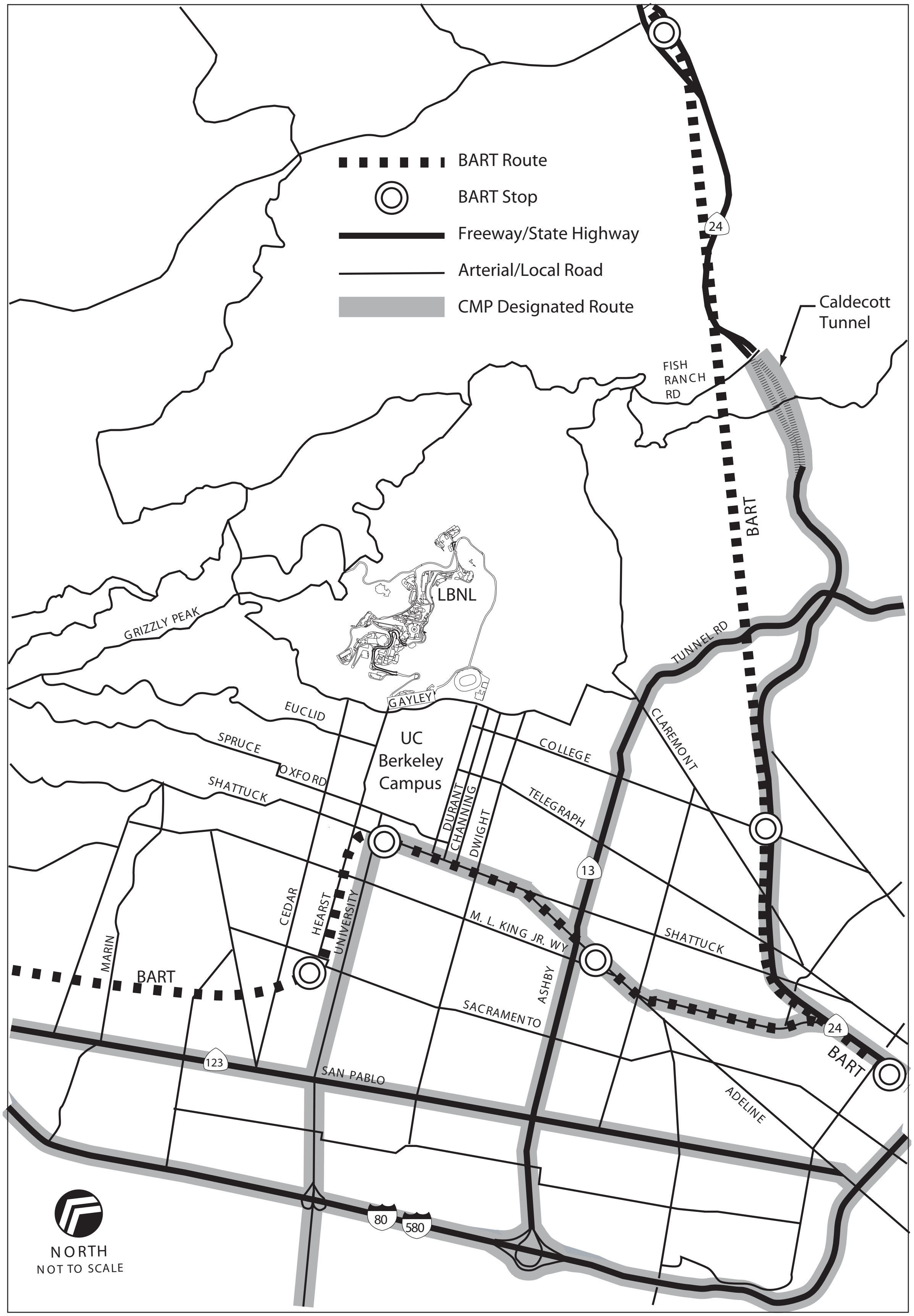
IV.L.2.1 Regional Roadways and Routes into Berkeley

Regional freeway access to LBNL is provided by I-80/580, SR 24, and SR 13. These roadways are part of both the Metropolitan Transportation Commission (MTC) Metropolitan Transportation System (MTS) and the Alameda County Congestion Management Agency (ACCMA) Congestion Management Program (CMP) network (see Figure IV.L-1). The primary objective of designating a CMP system is to monitor performance in relation to established level of service standards (ACCMA, 1999a). The MTS network is generally consistent with, but not identical to, the CMP network, encompassing 22 miles of local streets in the city of Berkeley not in the CMP network.

Interstate 80. I-80 connects the San Francisco Bay Area with the Sacramento region. Within Berkeley, I-80 runs along the western edge of the city in a north-south direction and provides five lanes of travel in each direction. Access from I-80 to the city of Berkeley is provided through interchanges at Ashby Avenue, University Avenue, and Gilman Street. I-80 and the nearby I-80/580 interchange operate at capacity during the peak commute hours. I-80 is monitored as a part of both the MTS and the CMP.

State Route 24. SR 24 links I-680 in Contra Costa County to I-80/I-580 and I-980. SR 24 provides four travel lanes in each direction in the Berkeley vicinity. This is the primary route used by Berkeley-bound travelers from eastern Contra Costa County. The primary access routes from SR 24 to the Berkeley Lab area are SR 13 (Ashby Avenue) to the Belrose-Derby-Warring-Piedmont corridor, and Telegraph Avenue. SR 24 is monitored as a part of the MTS and the CMP.

1 Interstate 80 (I-80) and Interstate 580 (I-580) share a roadway between Emeryville and Albany.



SOURCE: Wilbur Smith Associates

Figure IV.L-1
Project Site Location

State Route 13 / Ashby Avenue. SR 13 runs from I-580 in east Oakland to I-80, with a partial access interchange at SR 24. In Berkeley, SR 13 is Tunnel Road/Ashby Avenue, a two-lane arterial (almost all the way) running east-west through the city. Ashby Avenue intersects all of the major north-south roadways in Berkeley, providing several routes toward LBNL and the UC Berkeley campus. It is about 1.25 miles south of the Berkeley Lab. During the peak commute hours, on-street parking restrictions on the north side of Ashby Avenue in the morning and the south side in the evening provide an additional travel lane for commuters (City of Berkeley, 2001). SR 13 is identified as a part of the MTS and the CMP.

University Avenue. University Avenue provides one of Berkeley's three connections to I-80 to the west (along with Gilman Street and Ashby Avenue). It is an east-west major arterial that extends from the Berkeley Marina and I-80 in the west to the UC Berkeley campus in the east. The divided roadway has a center median and left-turn pockets at major intersections. Left turns from University Avenue onto cross-streets generally are not served by a separate left-turn signal. University Avenue is a four-lane roadway, with parallel parking permitted on both sides of the roadway. University Avenue is classified as a Principal Arterial in the MTS and the CMP.

Shattuck Avenue. Shattuck Avenue is a north-south major arterial that extends from north Berkeley to north Oakland. In the vicinity of the UC Berkeley campus and LBNL, Shattuck Avenue is a four-lane roadway. Parallel parking is permitted on both sides of the roadway. Shattuck Avenue's proximity to the SR 24 on- and off-ramps in Oakland make it a major southern entryway into Berkeley. In the downtown Berkeley area, Shattuck Avenue is the most heavily used north-south roadway. Shattuck Avenue is classified as a Principal Arterial in the MTS and the CMP.

Telegraph Avenue. Telegraph Avenue is a major north-south roadway connecting the UC Berkeley campus with Oakland to the south; access to LBNL requires an easterly or westerly deviation around the central UC Berkeley campus to Piedmont Avenue or Oxford Street to reach Hearst Avenue and the main LBNL entrance. Between the campus and Dwight Way, Telegraph Avenue is a two-lane, one-way, northbound roadway; south of Dwight Way, it is a four-lane roadway providing two-way travel. Telegraph Avenue's connection to SR 24 westbound ramps and its proximity to the SR 24 eastbound ramps at 51st Street in Oakland make it a major entryway to Berkeley. Telegraph Avenue is classified as a Principal Arterial in the MTS.

College Avenue. College Avenue is a major north-south street extending from the UC Berkeley campus at Bancroft Way south to SR 24 and into north Oakland. College Avenue provides a lower-capacity route to the UC Berkeley campus from SR 24; access to LBNL is available via a one-block easterly jog to Piedmont Avenue, then across the UC Berkeley campus via Piedmont and Gayley Road to Hearst Avenue. College Avenue has one travel lane per direction in the study area. Travel through this corridor is slower than along Telegraph or the Belrose corridor, due to numerous traffic signals, stop-controlled intersections, and a high volume of pedestrian crossings. College Avenue is classified as a Regional Arterial in the MTS.

Belrose-Derby-Warring-Piedmont Corridor. This is a heavily used route connecting SR 24 with Berkeley's Southside area (i.e., the area just south of the UC Berkeley campus) and Berkeley

Lab. With a single travel lane in each direction, the route is at capacity for several hours during the morning and evening commute periods. Using roadway signs and notices in official mailings, the City of Berkeley and UC Berkeley have been encouraging travelers to use other routes, like Telegraph Avenue. The Belrose-Derby-Warring-Piedmont corridor is not designated as a key route in either the MTS or the CMP.

IV.L.2.2 Local Roadways Serving the Project Site

The following local roadways provide access to the Berkeley Lab study area. (Unless otherwise noted, the speed limit on these streets is 25 miles per hour.)

Hearst Avenue is a two- to four-lane, east-west street that extends between west Berkeley and LBNL's main entrance at Cyclotron Road, which diverges from Hearst Avenue just east of Gayley Road along the northern boundary of the UC Berkeley campus. Between Gayley Road/La Loma Avenue and LeRoy Avenue, Hearst Avenue provides one travel lane each way, with parallel parking on both sides. During the peak commute hours, on-street parking restrictions on the south side of the street in the morning and the north side in the evening provide an additional travel lane for commuters. These lanes, however, are subject to parking restrictions. West of Shattuck Avenue, Hearst Avenue has a designated bicycle lane (Class II).

Bancroft Way is an east-west roadway extending from downtown Berkeley through the Southside area, along the southern boundary of the UC Berkeley campus. The roadway is one-way westbound, with two travel lanes from Piedmont Avenue to Telegraph Avenue and three travel lanes from Telegraph Avenue to the Bancroft Way/Oxford Street intersection. Bancroft Way is classified as a Regional Arterial in the MTS.

Durant Avenue is a major east-west roadway extending from downtown Berkeley through the Southside area. East of Shattuck Avenue, the roadway is one-way eastbound with three travel lanes. Durant Avenue serves as a "one-way couplet" with Bancroft Way for east-west travel on the south side of the UC Berkeley campus.

Channing Way connects Oxford/Fulton Streets to Piedmont Avenue. Channing Way is a two-lane, two-way road with parking on the north side of the street. It is a Class II bicycle route with painted bicycle lanes on both the north and south sides of the street from Prospect Street to Martin Luther King, Jr. Way, and a Class III bicycle route west of Martin Luther King, Jr. Way.

Haste Street lies between Channing Way and Dwight Way and provides access between Piedmont Avenue and Martin Luther King, Jr. Way. Haste Street has two westbound lanes forming a "one-way couplet" with Dwight Way.

Dwight Way is a two-lane, east-west street that runs east of Martin Luther King, Jr. Way. Parking is allowed on both sides of the street. Dwight Way between Sixth Street and Telegraph Avenue is a designated MTS route.

Bowditch Street is a north-south roadway extending from Bancroft Avenue to Dwight Way. It is a two-lane, two-way road with parking on the east side of the street. Bowditch Street has bicycle lanes (Class II) on both sides of the street along its entire length.

Oxford Street is a two- to four-lane, north-south street that runs between downtown Berkeley to the south and Marin Avenue to the north. Parking is allowed on both sides of the street.

Spruce Street is a north-south street, the south end of which intersects with Hearst Avenue in Berkeley's Northside area (i.e., the area just north of the UC Berkeley campus). The street's north end meets the north end of Wildcat Canyon Road and Grizzly Peak Boulevard near Summit Reservoir in the Berkeley Hills. In the vicinity of the UC Berkeley campus, Spruce Street is a two-lane, two-way residential street with permit-regulated parking and sidewalks on both sides.

Euclid Avenue is a two-lane, north-south residential street that extends from Hearst Avenue to Grizzly Peak Boulevard. It also serves as a main route for neighborhood residents in the hills to reach the UC Berkeley campus and downtown areas. Parking is permitted on both sides of the street.

LeRoy Avenue is a two-lane, north-south residential street that extends from Hearst Avenue to a half-block beyond Virginia Street. Parking is permitted on both sides of the street.

La Loma Avenue/Gayley Road is a two-lane, north-south residential street that extends from Hearst Avenue through north Berkeley. South of Hearst Avenue, La Loma Avenue becomes Gayley Road and borders the east side of the UC Berkeley campus. Parking is allowed on both sides of the street north of Hearst Avenue, but is not allowed south of Hearst Avenue until the vicinity of Memorial Stadium, where Gayley Road becomes Piedmont Avenue.

Stadium Rim Way wraps around the east and north sides of Memorial Stadium and connects the west end of Panoramic Way to Gayley Road near the Greek Theater. It provides access from Gayley Road and Prospect Street to the east side of Memorial Stadium and several surrounding parking facilities. Stadium Rim Way also intersects with Centennial Drive, thus indirectly providing access to the Lawrence Hall of Science, the Botanical Garden, and the Strawberry Canyon Recreational Area. On-street parking on Stadium Rim Way is designated as a parking lot by UC Berkeley, primarily on the east and north sides of the road. Sidewalks and metal poles separate pedestrian and vehicle traffic. Near the south end of Stadium Rim Way, the roadway narrows to one lane of traffic in both directions south of Canyon Road. It is believed that some through-traffic intended for Piedmont Avenue/Gayley Road uses Stadium Rim Way as a congestion bypass during peak hours.

Centennial Drive rounds the east and south perimeters of LBNL. It connects Grizzly Peak Boulevard and Stadium Rim Way and provides access to the Laboratory through the Strawberry Canyon and Grizzly Peak gates. It is also a main roadway for access to the Lawrence Hall of Science, the Botanical Garden, Strawberry Canyon Recreational Area, and Tilden Regional Park. In the vicinity of LBNL, the speed limit is 25 miles per hour. Several sections of the roadway have steep climbs; sharp curves are seen near LBNL, where the speed limit drops to 15 miles per hour. Pedestrian amenities are only available near and at the Lawrence Hall of Science and between Stadium Rim Way and Strawberry Creek.

Grizzly Peak Boulevard is a two-lane, two-way roadway located in the hills of Berkeley. Its south end meets Skyline Boulevard in the Sibley Volcanic Regional Preserve, and its north end intersects with Spruce Street near the Summit Reservoir in north Berkeley. North of the intersection with Centennial Drive, Grizzly Peak Boulevard extends through the hillside residential neighborhoods of north Berkeley. In the vicinity of LBNL, Grizzly Peak Boulevard runs between the western edge of Tilden Regional Park and the eastern edge of the University of California property line. The narrow and curvy roadway does not provide any pedestrian or bicyclist amenities south of Centennial Drive. The road does, however, provide access to parking spaces and the trails into Tilden Regional Park as well as to SR 24.

Internal Circulation. The Berkeley Lab hill site is served by an east-west traffic circulation system that generally conforms to the contours of the site's topography. Vehicles can enter Berkeley Lab through three gates (see Figure IV.L-2), which are attended by security personnel during business hours and accessible using a card access system when the gates are closed. The Laboratory's main vehicle routes are two-way, except for three sections where roadside parking reduces the width, permitting only one-way travel. The one-way portions are confusing for those unfamiliar with the site, and cause additional difficulties and expense for construction projects.

IV.L.2.3 Existing Traffic Conditions

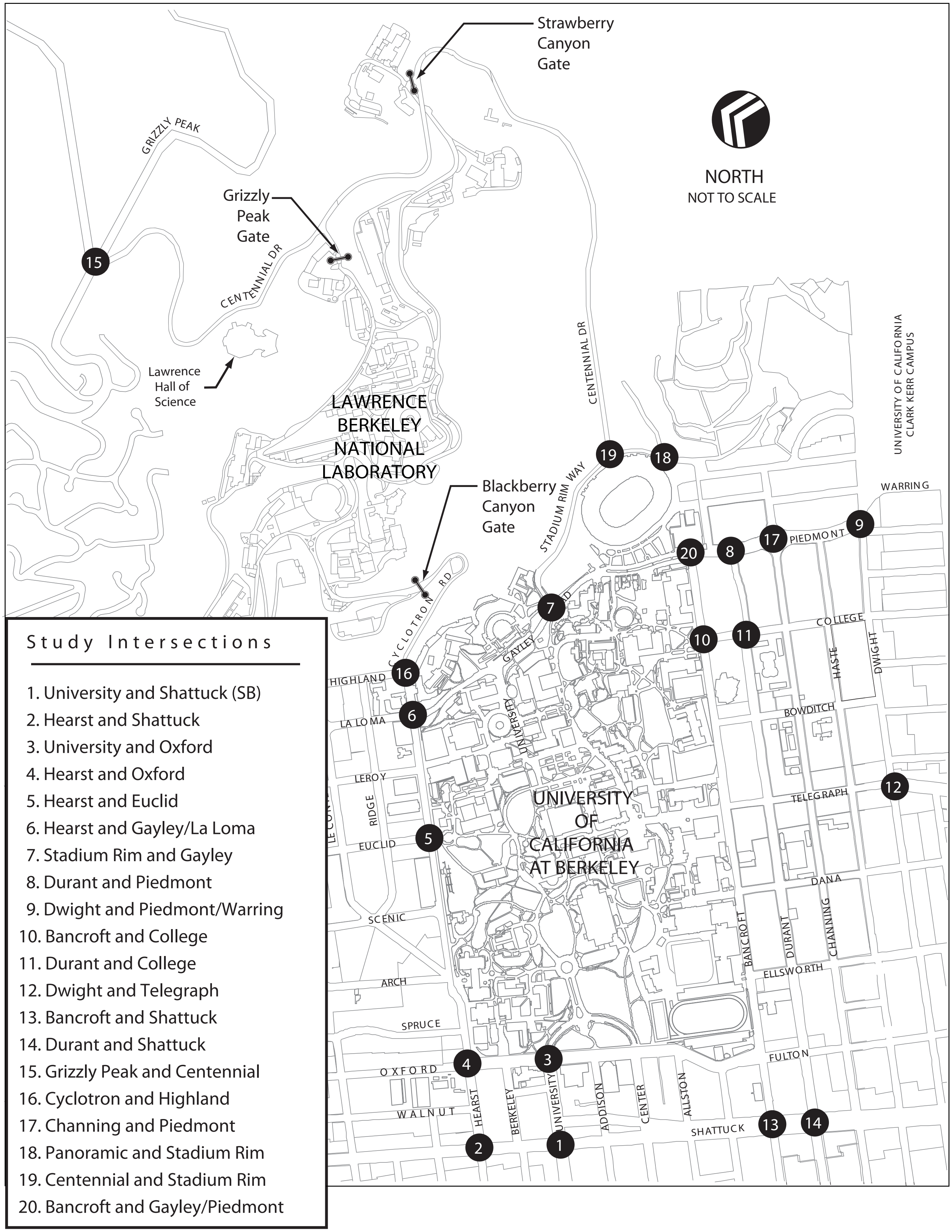
LBNL Trip Generation

Traffic entering and leaving the Berkeley Lab hill site was counted at each of the three LBNL gates on Thursday, October 29, 2003. The counts indicated that daily vehicle trip generation is approximately 5,700 (split roughly evenly between inbound and outbound traffic). During the morning peak hour, approximately 610 vehicle trips were made to and from the site, 540 of which were inbound (the peak direction). In the afternoon peak hour, 660 vehicle trips were made to and from the site, 585 of which were outbound (the peak direction).

Traffic on Regional Roadways

Existing level of service (LOS)[2] for freeways, based on the Transportation Research Board's *Highway Capacity Manual*, was determined based on the estimated travel speeds at different sections of the freeway. ACCMA's 2002 LOS monitoring indicates that the segments of I-80 through Berkeley are congested (LOS E or F) in both directions during morning and afternoon peak commute periods, and frequently during off-peak periods as well. SR 24 experiences LOS F in the eastbound direction from I-580 to the Caldecott Tunnel during the p.m. peak hour, in the portion within Oakland city limits. The only CMP arterial roadway operating at LOS F within the

[2] LOS A through C represent generally free-flow conditions; under LOS D conditions, maneuverability becomes more limited. LOS E and F represent conditions in which the roadway is at or approaching capacity, and breakdowns in traffic flow are more likely to occur.



Study Intersections

1. University and Shattuck (SB)
2. Hearst and Shattuck
3. University and Oxford
4. Hearst and Oxford
5. Hearst and Euclid
6. Hearst and Gayley/La Loma
7. Stadium Rim and Gayley
8. Durant and Piedmont
9. Dwight and Piedmont/Warring
10. Bancroft and College
11. Durant and College
12. Dwight and Telegraph
13. Bancroft and Shattuck
14. Durant and Shattuck
15. Grizzly Peak and Centennial
16. Cyclotron and Highland
17. Channing and Piedmont
18. Panoramic and Stadium Rim
19. Centennial and Stadium Rim
20. Bancroft and Gayley/Piedmont

SOURCE: Wilbur Smith Associates

Figure IV.L-2
Study Intersections

city of Berkeley is SR 13 (Ashby Avenue). Segments of Adeline Street and Shattuck Avenue operate at LOS E during peak hours, while portions of San Pablo Avenue in Emeryville and Oakland operate at LOS E or F.

Traffic on Local Roadways

The City of Berkeley has conducted daily counts on major city streets. Table IV.L-1 presents a daily traffic volume comparison based on 1977, 1987, and 2000 counts on some city streets. The data show that traffic has increased on some city streets but has dropped on others. Hence, a general growth trend in traffic volumes cannot be inferred from the data. Overall, the 2000 daily volumes are about 20 percent higher than 1977 volumes. When compared to 1987 volumes, however, the 2000 daily volumes are estimated to be 2 percent lower (City of Berkeley, 2001). In addition, the 2000 counts were conducted prior to completion of two major freeway improvements that directly affect traffic volumes through parts of Berkeley.[3]

TABLE IV.L-1
24-HOUR TRAFFIC VOLUME COMPARISON

Roadway Segment	1977 24-Hour Volume	1987 24-Hour Volume	2000 24-Hour Volume	Percent Change 1977–2000	Percent Change 1987–2000
Adeline (South of Ashby)	15,000	15,000	18,100	21%	21%
Ashby (Shattuck to Telegraph)	22,500	30,500	24,700	10%	-19%
Bancroft (Piedmont to College)	6,000	6,700	5,100	-15%	-24%
College (Ashby to Derby)	15,200	14,200	13,000	-14%	-8%
College (Derby to Dwight)	12,200	13,400	11,600	-5%	-13%
Dwight (San Pablo to Sacramento)	8,500	13,300	15,800	86%	19%
Gilman (6th to San Pablo)	13,300	17,400	17,500	32%	1%
Gilman (San Pablo to Santa Fe)	9,000	11,000	10,300	14%	-6%
I-80 (University to Ashby)	178,000	241,000	232,000	30%	-4%
I-80 (University to Gilman)	166,000	222,000	227,000	37%	2%
MLK, Jr. Way (Cedar to Rose)	14,500	15,700	14,700	1%	-6%
MLK, Jr. Way (Dwight to Allston)	21,000	21,000	17,700	-16%	-16%
MLK, Jr. Way (Ward to Ashby)	16,900	20,500	23,000	36%	12%
Oxford (Hearst to Cedar)	12,000	15,000	14,200	18%	-5%
Sacramento (Ashby to Alcatraz)	16,000	18,300	21,600	35%	18%
San Pablo (Ashby to Dwight)	23,400	24,000	29,500	26%	23%
San Pablo (Dwight to University)	23,400	21,300	24,900	6%	17%
San Pablo (University to Cedar)	26,500	25,000	27,000	2%	8%
Shattuck (Dwight to Adeline)	30,000	33,500	36,400	21%	9%
Shattuck (South of Ward)	20,000	19,000	22,300	12%	17%
Telegraph (Ashby to Oakland city limit)	23,000	24,600	28,200	23%	15%
Telegraph (Ashby to Derby)	26,600	26,000	19,900	-25%	-23%
University (San Pablo to Sacramento)	33,000	43,500	27,900	-15%	-36%
University (Sacramento to California)	29,000	36,200	32,400	12%	-10%

SOURCE: City of Berkeley, 2001.

3 The I-80 corridor improvements (including a carpool lane between SR 4 in Contra Costa County and the Oakland-San Francisco Bay Bridge) were completed in 2002. New connector ramps at the SR 24/SR 13 interchange were opened in 2001. The use of local streets through the City of Berkeley (i.e., San Pablo Avenue and Ashby Avenue, respectively) are expected to have decreased as a result of those freeway improvements.

Traffic at Intersections

The traffic impact analysis in this EIR includes 20 study intersections and evaluates both the a.m. and p.m. peak hours (generally 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.) for a typical mid-week day.[4] These intersections were selected because they are either in the immediate vicinity of the LBNL hill site or on key routes providing access to the UC Berkeley campus and Berkeley Lab. Of the 20 study intersections, 12 are controlled by traffic signals, and the remaining eight intersections are stop-sign-controlled. The locations of the study intersections and the type of intersection control are presented in Table IV.L-2.

Figure IV.L-2, p. IV.L-8, illustrates the location of the study intersections. The existing intersection geometry for the study intersections is shown in Figure IV.L-3.

Data on intersection turning movements were collected between November 2000 and April 2002 for the UC Berkeley LRDP EIR for most of the study intersections.[5] Turning movements at four additional intersections relevant to the analysis of LBNL's impacts were counted in late 2003.[6]

Intersection Level of Service Methodology

Operating characteristics of intersections are also described in terms of LOS, providing a qualitative description of conditions based on average delay per vehicle. Intersection level of service ranges from LOS A to LOS F. Both signalized and unsignalized intersections were evaluated using the 2000 *Highway Capacity Manual* operations methodology (TRB, 2000). For signalized intersections, LOS is based on the average delay (in seconds per vehicle) for the entire intersection. For unsignalized intersections, LOS is presented for the worst movement (i.e., the

4 The intersection of Hearst Avenue at Arch Street / Le Conte Avenue was recently signalized. Traffic counts were undertaken at this intersection in November 2006 (when UC Berkeley and City of Berkeley schools were in session), and peak-hour LOS was evaluated. The overall intersection is currently operating at LOS B during both the a.m. and p.m. peak hours, and traffic on the Hearst Avenue approaches to the intersection are operating at LOS C or better. As described herein, analysis of the 20 study intersections shows that LOS at the signalized intersections on Hearst Avenue upstream and downstream of Arch Street / Le Conte Avenue (at Oxford Street and Euclid Avenue) are an acceptable LOS D or better, and would remain so under cumulative with project conditions (i.e., a less-than-significant impact). A similar less-than-significant impact is reasonably foreseeable at the intersection of Hearst Avenue at Arch Street / Le Conte Avenue without the need of a detailed analysis, and this newly-signalized intersection was not included in the EIR as a formal study intersection.

5 Intersection turning movements consist of left turns, right turns, and through movements by vehicles.

6 To ensure that the previously counted turning movement volumes adequately represent current conditions, new traffic counts were undertaken at each of the study intersections in October 2006 (when UC Berkeley and City of Berkeley schools were in session). In general, the volumes counted in 2006 were lower than those counted previously, with 18 of 20 intersections having current volumes in both the a.m. and p.m. peak hours that were between 3 percent and 39 percent lower than those counted earlier. Exceptions were at Centennial/Stadium Rim Way (a.m. peak hour, 5-percent increase, but overall volumes remain very low), and Dwight/Piedmont-Warring and College/Bancroft (p.m. peak hour, 9-percent and 4-percent increases, respectively, with little or no increase in the conflicting movements that determine level of service). At the Panoramic Way/Canyon Road/Stadium Rim Way intersection, a.m. peak-hour volumes were essentially unchanged (although p.m. peak-hour volumes declined by 20 percent between the 2003 and 2006 counts). All intersections where volumes increased between the prior counts and the 2006 counts currently operate (and will operate in the future) at good levels of service (LOS B or C). The October 2006 counts were also compared to the volumes counted for the UC Berkeley Southeast Campus Integrated Projects (SCIP) EIR (taken in January 2006). Once again, the current counts are lower, except at Centennial/Stadium Rim Way (a.m. peak hour, increase of 33 percent but, as stated above, the overall volume was low and the level of service remained good) and Bancroft/Gayley-Piedmont (p.m. peak hour, increase of 5 percent, but there was a decrease in conflicting movements that determine level of service).

TABLE IV.L-2
STUDY INTERSECTIONS

Intersection		Control
1.	University Avenue at Shattuck Avenue	Signal
2.	Hearst Avenue at Shattuck Avenue	Signal
3.	University Avenue at Oxford Street	Signal
4.	Hearst Avenue at Oxford Street	Signal
5.	Hearst Avenue at Euclid Avenue	Signal
6.	Hearst Avenue at Gayley Road/La Loma Avenue	Signal
7.	Gayley Road at Stadium Rim Way	All-Way Stop
8.	Durant Avenue at Piedmont Avenue	All-Way Stop
9.	Dwight Way at Piedmont Avenue	Signal
10.	College Avenue at Bancroft Way	Signal
11.	Durant Avenue at College Avenue	Signal
12.	Telegraph Avenue at Dwight Way	Signal
13.	Shattuck Avenue at Bancroft Way	Signal
14.	Shattuck Avenue at Durant Avenue	Signal
15.	Grizzly Peak Boulevard at Centennial Drive	All-Way Stop
16.	Cyclotron Road at Highland Place	Two-Way Stop
17.	Channing Way at Piedmont Avenue	Two-Way Stop
18.	Panoramic Way at Canyon Road/Stadium Rim Way	Two-Way Stop[a]
19.	Centennial Drive at Stadium Rim Way	All-Way Stop
20.	Bancroft Way at Gayley Road/Piedmont Avenue	All-Way Stop[b]

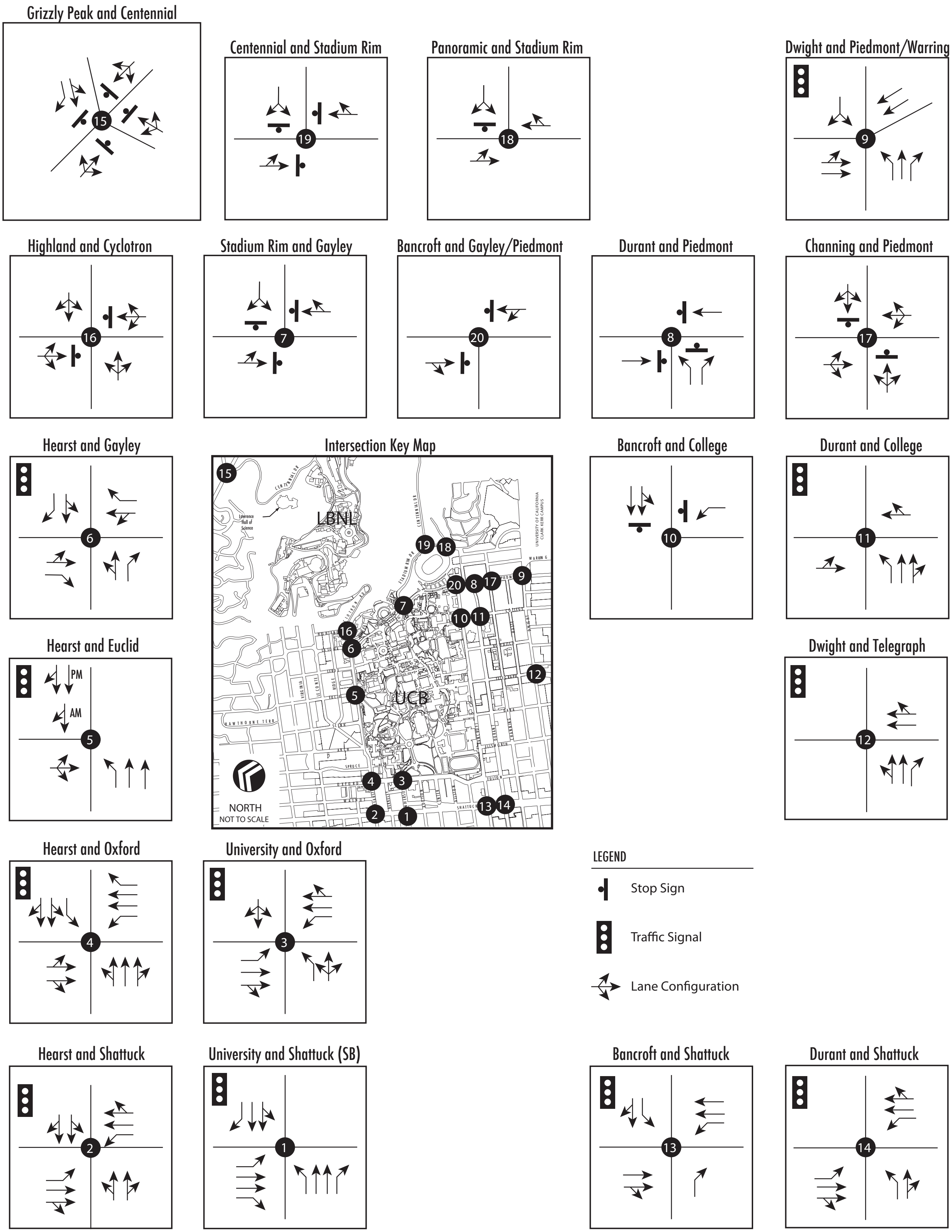
[a] A T-intersection is analyzed as a two-way stop intersection although only one leg (the “stem” of the T) is stop-controlled.
[b] Traffic approaches this intersection only on two of the three streets (Gayley and Piedmont); Bancroft is one-way westbound (outbound) from the intersection.

SOURCE: Wilbur Smith Associates, 2004.

movement with the greatest delay in seconds per vehicle) that is controlled by stop signs. LOS A represents minimal delay, while LOS F represents heavy congestion, with average vehicle delay that is generally unacceptable to most drivers.

Existing Intersection Operations

All study intersections operate at LOS D or better during both the a.m. and p.m. peak hours, except for the stop-sign-controlled intersection of Channing Way and Piedmont Avenue, which operates at LOS E in the a.m. peak hour and LOS F in the p.m. peak hour; and the stop-sign-controlled intersection of Bancroft Way and Gayley Road/Piedmont Avenue, which operates at LOS F during both peak hours. The LOS and delay estimates for the study intersections under existing conditions are shown in Table IV.L-3. Intersection turning movement volumes and LOS under existing conditions are shown in the figures provided in Appendix J.



SOURCE: Wilbur Smith Associates

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Figure IV.L-3
Intersection Geometry

TABLE IV.L-3
EXISTING INTERSECTION LEVEL OF SERVICE[a]

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (seconds)	LOS	Delay (seconds)
1. University Avenue at SB Shattuck Avenue	B	19.7	B	18.2
2. Hearst Avenue at Shattuck Avenue	A	6.1	B	14.5
3. University Avenue at Oxford Street	C	29.0	B	18.2
4. Hearst Avenue at Oxford Street	A	10.0	D	52.8
5. Hearst Avenue at Euclid Avenue	B	15.4	B	16.9
6. Hearst Avenue at Gayley Road/La Loma Avenue	C	22.4	C	24.3
7. Gayley Road at Stadium Rim Way	D	26.2	D	34.7
8. Durant Avenue at Piedmont Avenue	C	17.4	C	17.6
9. Dwight Way at Piedmont Avenue	A	9.4	B	13.1
10. College Avenue at Bancroft Way	B	11.8	B	12.3
11. Durant Avenue at College Avenue	A	9.2	B	13.4
12. Telegraph Avenue at Dwight Way	B	16.2	C	20.2
13. Shattuck Avenue at Bancroft Way	A	8.6	B	12.7
14. Shattuck Avenue at Durant Avenue	B	11.3	B	14.0
15. Grizzly Peak Boulevard at Centennial Drive	B	10.2	C	17.7
16. Cyclotron Road at Highland Place	B	12.7	B	12.7
17. Channing Way at Piedmont Avenue	E	38.5	F	>50
18. Panoramic Way at Canyon Road/Stadium Rim Way	B	10.2	B	12.1
19. Centennial Drive at Stadium Rim Way	A	9.2	B	12.2
20. Bancroft Way at Gayley Road/Piedmont Avenue[b]	F	>50	F	>50

[a] The level of service (LOS) and delay for two-way (side-street) stop intersections represent the worst movement or approach. The LOS and delay for other intersections (signalized and all-way stop) represent the overall intersection.
[b] Based on 2000 Highway Capacity Manual methodology, this intersection operates at LOS D during the a.m. peak hour and LOS C during the p.m. peak hour under existing conditions. However, this does not take into account pedestrian volumes. Based on field observations, this intersection has a heavy pedestrian volume, resulting in major delays for vehicles under existing conditions.

SOURCE: Wilbur Smith Associates, 2004.

IV.L.2.4 Existing Parking Conditions

The parking analysis is based on the LBNL Parking Operations Plan completed in 1999 and a survey update undertaken for this EIR in 2003.

Parking at Lawrence Berkeley National Laboratory

The 1999 LBNL Parking Operations Plan documented an inventory of 2,160 regular parking spaces on the LBNL hill site, consisting of 1,763 off-street spaces and 397 on-street spaces. The inventory and occupancy update undertaken in October 2003 found a net addition of 15 spaces in the general parking category, for a total of 2,175 marked spaces (LBNL, 1999 and 2003). LBNL uses a working estimate of 2,300 spaces, which includes informal parking in some lots and on unpaved graded areas.

Table IV.L-4 shows the parking supply provided on the LBNL site by permit type. The Berkeley Lab site is constrained by hilly geographic features. As such, parking areas on the site are relatively small in size but spread out, like the buildings they serve (see Figure IV.L-4).

TABLE IV.L-4
LBNL PARKING SUPPLY SUMMARY BY PERMIT TYPE

Location	Number of Spaces	Permit Type: BT (Blue Triangle)	G (General)	S (Government)	C (Director)	All others (D, M, LZ, E, T)
Off-Street	1,778	303	1,106	236	31	102
On-Street	397	5	354	24	0	14
Total	**2,175**	**308**	**1,460**	**260**	**31**	**116**

SOURCE: LBNL, 1999 and 2003.

No single lot has 10 percent of the parking supply, and few have even 5 percent of the total. Because access to LBNL is controlled, parking facilities are not open to the general public. The Lab has a set of parking regulations, which include the issuance of parking permits.

In general, when the overall peak occupancy rate of a parking facility is above 90 percent, the facility is said to be occupied beyond the "practical capacity" level. When occupancy rates exceed this practical capacity level, drivers must often circle to find available parking and may be tempted to park illegally.

In the 1999 Parking Operations Plan, the overall peak occupancy rate was estimated to be 80 percent during the midday peak (leaving about 460 vacant spaces, based on 2,300 total spaces), which is below the "practical capacity" level. (In the 2003 update, a slightly higher rate of 82 percent was found.) Occupancy rates were relatively high throughout much of the day.

In 1999, nine of the total 36 lots were observed to be over the 90-percent occupancy threshold; in 2003, 14 lots were over the threshold. Although there is a substantial amount of unused parking on the LBNL site, it is scattered, and numerous locations are above practical capacity. In the 2003 survey update, only two lots had more than 20 vacant spaces at midday, and only 12 lots (one-third of the total) had more than 10 vacant spaces. Hence, many areas experience a lack of available parking. Figure IV.L-5 depicts the peak midday parking occupancy at the Lab in 2003.

Although the vast majority of vehicles are employee commute vehicles, there is a considerable amount of turnover, especially in certain lots. The turnover and duration figures, based on the 1999 study, suggest that parking availability is an issue throughout the day (that is, a large percentage of employees need to park at various times after 9:00 a.m.). High parking turnover is likely due to employees driving from one office to another on the Lab grounds, returning from off-site trips, and arriving in the mid- or late morning (due to staggered work hours or evening or early morning meetings).

LBNL has a comprehensive trip management program that is aimed at reducing the number of employee vehicle trips and includes promoting the use of carpools. Providing reserved parking for "pool" vehicles encourages vanpooling and carpooling, and most buildings provide bicycle

SOURCES: Wilbur Smith Associates

Figure IV.L-4
Parking Supply Map

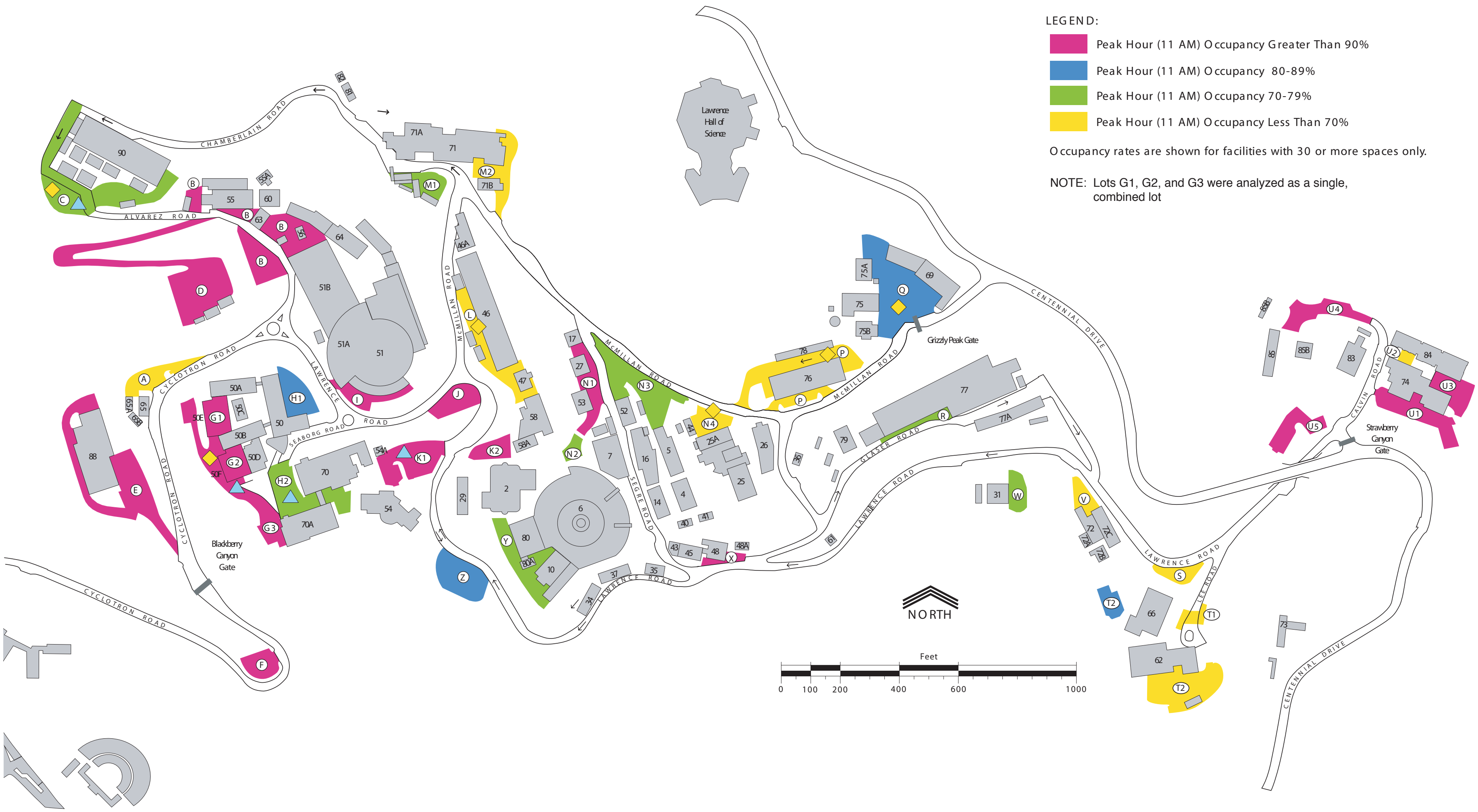

Figure IV.L-5
2003 Midday Parking Lots Occupancy Rates

parking close to entrances. See Appendix G for details of LBNL's proposed new Transportation Demand Management Plan.

Off-Site Parking

Few LBNL employees park in UC Berkeley campus facilities, even among the approximately 350 Lab employees who work on the UC Berkeley campus. This is likely because parking at LBNL is free, whereas virtually no free parking is provided in UC Berkeley campus-controlled facilities.

In the immediate vicinity of the UC Berkeley campus to the south and west of LBNL, on-street parking spaces are metered and have a time limit of one hour. North and west of Berkeley Lab, on-street parking is limited to two hours for non-residents between 8:00 a.m. and 6:00 p.m., under the City's residential permit parking program (City of Berkeley, 2001). These facilities, therefore, are not a viable option for LBNL parkers.

IV.L.2.5 Existing Transit and Shuttle Services

The Berkeley Lab site is served indirectly by BART and Alameda–Contra Costa Transit (AC Transit) bus routes, and directly by LBNL-run shuttle service routes.

Public Transit Services

BART service operates from 4:00 a.m. to midnight, Monday through Friday; 6:00 a.m. to midnight on Saturdays; and 8:00 a.m. to midnight on Sundays. During the week, BART has 15-minute headways all day on both the Richmond–Daly City and Richmond–Fremont lines in both directions. The Pittsburg/Bay Point line, which serves the Rockridge BART station, operates 5- to 10-minute headways during peak hours and 15-minute headways midday. AC Transit, with 11 lines serving the UC Berkeley campus area (Lines 7, 9, 40, 43, 51, 52, 52L, 65, 67, and TransBay Lines F and FS), provides travel to and from neighboring cities such as Oakland, Richmond, El Cerrito, San Francisco, and local Berkeley neighborhoods. None of these routes serves LBNL directly, but the routes do connect with LBNL shuttle lines (see below). Figure IV.L-6 shows the existing public transit routes serving the general UC Berkeley campus area.

An alternatives analysis study by the Alameda County Congestion Management Agency is currently underway to evaluate options for bus rapid transit in the Telegraph Avenue/ East 14th Street/International Boulevard corridor. This project would provide a new transit service to the downtown Berkeley and UC campus areas, with a possible loop around the campus.

LBNL Shuttle Services

The downtown Berkeley BART station at Center Street/Shattuck Avenue and the Rockridge BART station on College Avenue are key facilities for LBNL employees not residing in the immediate vicinity. The downtown Berkeley BART station is served at 10-minute intervals by the LBNL Hearst Street shuttle between 6:20 a.m. and 5:50 p.m., then at 20-minute headways until 6:50 p.m. An express shuttle to the Rockridge BART Station is also provided at hourly intervals

SOURCES: Wilbur Smith Associates

LBNL 2006 Long Range Development Plan . 201074

Figure IV.L-6
Transit Routes

in the peak direction during commute hours. Employees and visitors engaging in official Laboratory business are permitted to use the LBNL shuttle services. Shuttle stops have been coordinated with AC Transit bus lines serving downtown Berkeley.

Approximately one-third of Berkeley Lab's employees (and about one-fourth of those with hill site parking permits) reside within the city of Berkeley and therefore have a greater number of commute options than more distant employees. LBNL has several pedestrian gates, and the Lab shuttle stops at nearby residential neighborhoods. Those living farther away can ride transit or can bicycle to a shuttle stop; Lab shuttle buses carry bicycle racks for the ride up the hill.

LBNL also provides commuting options for employees who live some distance from the site. In addition to supporting carpooling and vanpooling arrangements, the Lab has integrated its off-site shuttle bus system with the local and regional mass transit systems.

IV.L.2.6 Existing Pedestrian and Bicycle Circulation

The 1999 LBNL Parking Operations Plan and the 2003 update included field observations of pedestrian and bicycle activities (LBNL, 1999 and 2003). Overall, light pedestrian and bicyclist traffic was observed in and around LBNL. Although their exact numbers are not known, most staff members who commute by walking or bicycling use the Blackberry Canyon entrance, according to gate security staff. Lesser numbers – about 10 pedestrians and bicyclists for each peak hour – use the Grizzly Peak or Strawberry Canyon gates.

The LBNL site is located on very hilly terrain with steep grades. On-site pedestrian and bicycle paths meander and have many discontinuities. Pedestrian pathways are primarily used for connecting parking areas to buildings, as the parking facilities are not generally immediately adjacent to the buildings they serve. Employees typically walk to cafeterias, to reach their cars, and to gather for meetings at major buildings and at shuttle stops. Longer trips within the LBNL site are served by the on-site shuttle.

Bicycle activity is most evident during the afternoon commute hours, as bicyclists who used shuttle bus bike racks on their uphill inbound trip to work ride bicycles down hill in their outbound trip. Berkeley Lab's shuttle bus system accommodates bicycles, a feature that is widely used. Bicyclists share all roadways with vehicles and are provided bicycle lanes where feasible.

IV.L.2.7 Existing Use of Alternative Travel Modes

At present, nearly 40 percent of Berkeley Lab employees use alternatives to single-occupant vehicles to travel to and from work. Other than the Lab's own shuttle, bicycling is the most popular form of non-auto commuting, attracting about 10 percent of the work force. BART and carpooling, each attracting about 8 percent of employees, are the next most common alternative travel modes.

IV.L.2.8 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant polices contained in the Berkeley and Oakland general plans.

Berkeley General Plan

About 95 acres, or almost half of the LBNL site, is within the city of Berkeley. The Land Use Element of the Berkeley General Plan contains comprehensive objectives and policies that guide physical development in the city. One objective of the Land Use Element is to "minimize the negative impacts and maximize the benefits of University of California on the citizens of Berkeley."

The Transportation Element of the Berkeley General Plan contains the following policies relevant to the proposed 2005 LBNL LRDP:

> Transportation Objective 1: Maintain and improve public transportation services throughout the city.
>
> Transportation Objective 2: Reduce automobile use and vehicle miles traveled in Berkeley, and the related impacts, by providing and advocating for transportation alternatives and subsidies that facilitate voluntary decisions to drive less.
>
> Transportation Objective 6: Create a model bicycle- and pedestrian-friendly city where bicycling and walking are safe, attractive, easy, and convenient forms of transportation and recreation for people of all ages and abilities.
>
> Policy T-2 Public Transportation Improvements: Encourage regional and local efforts to maintain and enhance public transportation services and seek additional regional funding for public and alternative transportation improvements.
>
> *Action T-2 D*: Improve shuttle and transit services by:
>
> 1. Increasing shuttle and transit services from Rockridge and the Rockridge BART station to downtown BART and the UCB campus.
> 3. Promoting express shuttle services to complement local transit service and ensure that Berkeley residents and commuters have information about shuttle services readily available.
> 5. Encouraging transportation providers to coordinate and consolidate the installation of new jointly used shelters.
>
> Policy T-10 Trip Reduction: To reduce automobile traffic and congestion and increase transit use and alternative modes in Berkeley, support, and when appropriate require, programs to encourage Berkeley citizens and commuters to reduce automobile trips, such as:

2. Participation in the Commuter Check Program.
3. Carpooling and provision of carpool parking and other necessary facilities.
4. Telecommuting programs.
8. Programs to encourage neighborhood-level initiatives to reduce traffic by encouraging residents to combine trips, carpool, telecommute, reduce the number of cars owned, shop locally, and use alternative modes.
9. Programs to reward Berkeley citizens and neighborhoods that can document reduced car use.
10. Limitations on the supply of long-term commuter parking and elimination of subsidies for commuter parking.

Policy T-13 Major Public Institutions: Work with other agencies and institutions, such as the University of California, the Berkeley Unified School District, Lawrence Berkeley Laboratory, Vista Community College, the Alameda County Court, and neighboring cities to promote Eco-Pass and to pursue other efforts to reduce automobile trips.

Action T-13A: Encourage other agencies and institutions to match or exceed the City of Berkeley’s trip reduction and emission reduction programs for their employees.

Action T-13C: Encourage the University of California:

1. To maintain and improve its facilities and programs that support and encourage pedestrians, bicyclists, and transit riders.
2. To provide bicycle facilities, “all hour” bicycle paths, and timely pavement maintenance.
3. To locate non-student-serving offices and additional staff and student housing at or near BART stations outside Berkeley.

Action T-13H: Encourage the University of California, the Berkeley Unified School District, and other major institutions to cap parking at current levels while seeking to reduce automobile use.

Action T-13I: Encourage institutions to create incentives for their employees and students to live locally.

Action T-13J: Encourage all public and private institutions, including schools, health clubs, recreation centers and other community destinations to organize carpools and shuttles.

Policy T-18 Level of Service: When considering transportation impacts under the California Environmental Quality Act, the City shall consider how a plan or project affects all modes of transportation, including transit riders, bicyclists, pedestrians, and motorists, to determine the transportation impacts of a plan or project. Significant beneficial pedestrian, bicycle, or transit impacts, or significant beneficial impacts on air quality, noise, visual quality, or safety in residential areas may offset or mitigate a significant adverse impact on vehicle Level of Service (LOS) to a level of insignificance. The number of transit riders, pedestrians, and bicyclists potentially affected will be considered when evaluating a degradation of LOS for motorists.

Policy T-28 Emergency Access: Provide for emergency access to all parts of the city and safe evacuation routes.

Policy T-31 Residential Parking: Regulate use of on-street parking in residential areas to minimize parking impacts on neighborhoods…

Policy T-34 Downtown and Southside Parking Management: Manage the supply of Downtown and Southside public parking to discourage long-term all-day parking and increase the availability and visibility of short-term parking for local businesses.

Policy T-37 University of California and Large Employer Parking: Encourage large employers, such as the University of California and Berkeley Unified School District, to allocate existing employee parking on the basis of a) need for a vehicle on the job, b) number of passengers carried, c) disability, and d) lack of alternative public transportation.

Action T-37A: Encourage the University of California to cap its parking supply at current levels, to postpone any plans to expand its existing (year 2000) parking supply and instead encourage transit use and alternative modes of transportation, and better manage and utilize existing parking.

Policy T-38 Inter-Jurisdictional Coordination: Establish partnerships with adjacent jurisdictions and agencies, such as the University of California and the Berkeley Unified School District, to reduce parking demand and encourage alternative modes of transportation.

Policy T-41 Structured Parking: Encourage consolidation of surface parking lots into structured parking facilities and redevelopment of surface lots with residential or commercial development where allowed by zoning.

Policy T-42 Bicycle Planning: Integrate the consideration of bicycle travel into City planning activities and capital improvement projects, and coordinate with other agencies to improve bicycle facilities and access within and connecting to Berkeley.

Policy T-54 Pathways: Develop and improve the public pedestrian pathway system.

Oakland General Plan

The following transportation-related policies in the Oakland General Plan Land Use and Transportation Element are applicable to the 2006 LRDP:

Policy T2.1 Encouraging Transit-Oriented Development: Transit-oriented development should be encouraged at existing and proposed transit nodes, defined by the convergence of two or more modes of public transit such as BART, bus, shuttle service, light rail or electric trolley, ferry, and inter-city or commuter rail.

Policy T2.5 Linking Transportation and Activities: Link transportation facilities and infrastructure improvements to recreational uses, job centers, commercial nodes, and social services (i.e., hospitals, parks, or community centers).

Policy T3.2 Promoting Strategies to Address Congestion: The City should promote and participate in both local and regional strategies to manage traffic supply and demand where unacceptable levels of service exist or are forecast to exist.

> Policy T3.6 Including Bikeways and Pedestrian Walks: The City should include bikeways and pedestrian walks in the planning of new, reconstructed, or realigned streets, wherever possible.
>
> Policy T3.6 Encouraging Transit: The City should encourage and promote use of public transit in Oakland by expediting the movement of and access to transit vehicles on designated “transit streets” as shown on the Transportation Plan.
>
> Policy T4.2 Creating Transportation Incentives: Through cooperation with other agencies, the City should create incentives to encourage travelers to use alternative transportation options.
>
> Policy D3.2 Incorporating Parking Facilities: New parking facilities for cars and bicycles should be incorporated into the design of any project in a manner that encourages and promote safe pedestrian activity.
>
> Policy N1.2 Placing Public Transit Stops: The majority of commercial development should be accessible by public transit. Public transit stops should be placed at strategic locations in Neighborhood Activity Centers and Transit-Oriented Districts to promote browsing and shopping by transit users.

Policies in the Open Space, Conservation, and Recreation (OSCAR) Element of the Oakland General Plan pertaining to transportation relevant to the LBNL LRDP include the following:

> Policy CO-12.1: Promote land use patterns and densities which help improve regional air quality conditions by: (a) minimizing dependence on single passenger autos; (b) promoting projects which minimize quick auto starts and stops, such as live-work development, and office development with ground-floor retail space; (c) separating land uses which are sensitive to pollution from the sources of air pollution; and (d) supporting telecommuting, flexible work hours, and behavioral changes which reduce the percentage of people in Oakland who must drive to work on a daily basis.
>
> Policy CO-12.3: Expand existing transportation systems management and transportation demand management strategies which reduce congestion, vehicle idling, and travel in single-passenger autos.

IV.L.3 Impacts and Mitigation Measures

IV.L.3.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines and the UC CEQA Handbook, the impact of the proposed LRDP on transportation would be considered significant if it would exceed any of the following Standards of Significance:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections), as follows:
    - Cause levels of service at an intersection to degrade below LOS D, based on total intersection delay or on minor street delay for two-way stop-controlled intersections (2000 Highway Capacity Manual methodology); or

  - Cause levels of service at an intersection to degrade from LOS E to LOS F, based on total intersection delay or on minor street delay for two-way stop-controlled intersections (2000 Highway Capacity Manual methodology); or

  - Cause a significant incremental decline in service at an intersection operating, without the addition of project traffic, at LOS E or worse (defined for purposes of analysis as an increase in total traffic volume of 5 percent or more, relative to the No Project volume);[7]

- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for its biennial monitoring of Congestion Management Plan (CMP)-designated roads or highways, as follows:

  - On CMP-designated roadway segments that are projected to meet the CMP standard in the future without the project (2025), the impact would be significant if the project would cause the segment to exceed the standard and add at least 5 percent to the future peak hour volume, or

  - On CMP-designated roadway segments that are projected to exceed the CMP standard in the future without the project (2025), the impact would be significant if the project would add at least 5 percent to the future peak hour volume.

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses;

- Result in inadequate emergency access;

- Result in inadequate parking capacity; or

- Conflict with applicable policies, plans, or programs supporting alternative transportation or generate new transit demand that cannot be served by the expected future transit service, including improvements planned by UC and non-UC transit agencies (BART, AC Transit, LBNL shuttles).

IV.L.3.2 2006 LRDP Principles, Strategies and the LBNL Design Guidelines

The 2006 LRDP proposes four fundamental principles that form the basis for the Plan's development strategies provided for each element of the Plan. All four principles are applicable to the traffic-related aspect of new development: 1) "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship"; 2) "Build a safe, efficient, cost effective scientific infrastructure capable of long-term support of evolving scientific missions"; 3) "Build a more campus-like research environment"; and 4) "Improve access and connections to enhance scientific and academic collaboration and interaction."

[7] The 5-percent threshold is based on the fact that day-to-day traffic volumes can fluctuate by as much as 10 percent (i.e., ± 5 percent), and therefore a variation of 5 percent is unlikely to be perceptible to the average motorist. This is a commonly used threshold in the City of Berkeley and other jurisdictions.

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP (see Chapter III, Project Description, for further discussion, and see Appendix B for a full listing of principles, strategies and design guidelines). Development strategies set forth in the 2006 LRDP applicable to traffic include the following:

- Increase development densities within the areas corresponding to the existing clusters of development to preserve open space, enhance operational efficiencies and access.
- Site and design new facilities in accordance with University of California Presidential Policy for Green Building Design to reduce energy, water and material consumption and provide improved occupant health, comfort and productivity.
- Increase use of alternate modes of transit through improvements to the Laboratory's shuttle bus service.
- Promote transportation demand management strategies such as vanpools and employee ride share programs.
- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates.
- Create a better linkage between parking, shuttle stops, and pedestrian circulation on site.
- Provide separated routes of travel wherever possible for pedestrians and vehicles.
- Promote use of bicycles by providing additional storage racks and shower facilities.
- Eliminate parking from the sides of major roadways, thereby improving safety and allowing one-way roads to be converted to two-way traffic.
- Maintain or reduce the percentage of parking spaces relative to the adjusted daily population.
- Consolidate parking into larger lots and/or parking structures, locate these facilities near Laboratory entrances to reduce traffic within the main site.
- Remove parking from areas targeted for outdoor social spaces and service areas.
- Consolidate service functions wherever possible in the Corporation Yard.
- Use pedestrian routes to connect the various developed terraces of the site which host the central and research clusters.
- Improve the pedestrian spaces at the heart of the research clusters and adjacent to research facilities so as to support interaction among Laboratory users.
- Retain and improve walkways as appropriate throughout the open space portions of the site, carefully integrating these pathways to minimize intrusion in the natural environment.
- Improve pedestrian access and safety throughout the Laboratory site by developing new routes and enhancing existing routes.

- Improve wayfinding through a comprehensive and coordinated signage system and through the naming of buildings and research clusters.
- Improve the path providing access to and from the UC Berkeley campus.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP. The Design Guidelines are proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the Plan's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provide specific planning and design guidance relevant to the traffic-related aspects of new development to achieve these design objectives:

- Stimulate pedestrian activity and interaction in the Commons Spaces.
- Create as high a density and critical mass around commons spaces as possible.
- Segregate public entries and paths from service entries and paths where feasible.
- Where segregation is not possible, and service and public access overlap in accessing buildings, design service courts to intelligently serve both.
- Design Pathway Layouts that support pedestrian flow and encourage casual interaction.
- Design all new streets to accommodate two-way traffic flow and pedestrian access.
- Reduce the amount of impermeable surfaces at the Lab.
- Minimize visual and environmental impacts of new parking lots.
- Create parking plazas to accommodate multiple functions where restricted sites do not allow for them to be segregated.
- Site and design parking structures to integrate with the natural surroundings.

IV.L.3.3 Methodology for Cumulative Traffic Forecasts

Prior to assessing project impacts, a future baseline forecast of transportation conditions was prepared for 2025. This forecast was based on the 2020 LRDP study for UC Berkeley. This transportation analysis used the turning movements developed in the 2020 LRDP and scaled up the traffic volumes to projected 2025 levels (since 2025 is the horizon year of the 2006 LRDP). For this analysis, traffic generated by the UC Berkeley 2020 LRDP was assumed to be part of future baseline conditions. That is, the UC Berkeley LRDP "With Project" scenario for 2020 was used as the "Without Project" scenario for analysis of the LBNL 2006 LRDP (after adjusting 2020 traffic to 2025 levels). Table IV.L-5 presents the levels of service and intersection delays for the 2025 baseline for the 20 study intersections.

TABLE IV.L-5
INTERSECTION LEVEL OF SERVICE – 2025 WITHOUT PROJECT

Intersection	Control	AM Peak LOS	AM Peak Delay (seconds)	PM Peak LOS	PM Peak Delay (seconds)
1. University Avenue at SB Shattuck Avenue	Signal	D	35.7	C	21.5
2. Hearst Avenue at Shattuck Avenue	Signal	A	8.2	C	23.9
3. University Avenue at Oxford Street	Signal	D	39.5	C	29.0
4. Hearst Avenue at Oxford Street	Signal	B	11.7	D	50.1
5. Hearst Avenue at Euclid Avenue	Signal	B	17.1	B	16.3
6. Hearst Avenue at Gayley Road/La Loma Avenue	Signal	E	57.3	E	57.2
7. Gayley Road at Stadium Rim Way	All-Way Stop	F	>50	F	>50
8. Durant Avenue at Piedmont Avenue	All-Way Stop	E	45.5	D	34.2
9. Dwight Way at Piedmont Avenue	Signal	B	10.9	B	13.6
10. College Avenue at Bancroft Way	Signal	C	16.9	C	15.6
11. Durant Avenue at College Avenue	Signal	B	13.4	B	13.6
12. Telegraph Avenue at Dwight Way	Signal	B	18.2	C	34.3
13. Shattuck Avenue at Bancroft Way	Signal	B	10.6	C	21.8
14. Shattuck Avenue at Durant Way	Signal	B	13.9	C	23.4
15. Grizzly Peak Boulevard at Centennial Drive	All-Way Stop	B	11.1	C	23.2
16. Cyclotron Road at Highland Place	Two-Way Stop	B	14.5	C	13.0
17. Channing Way at Piedmont Avenue	Two-Way Stop	F	>50	F	>50
18. Panoramic Way at Canyon Rd./Stadium Rim Way	Two-Way Stop	B	10.3	B	12.5
19. Centennial Drive at Stadium Rim Way	All-Way Stop	A	9.5	B	11.9
20. Bancroft Way at Gayley Road/Piedmont Avenue	All-Way Stop	F	>50	F	>50

LOS = level of service

SOURCE: Wilbur Smith Associates, 2004.

IV.L.3.4 Impacts and Mitigation Measures

Methodology

Once the future baseline conditions were established, future LBNL traffic growth was forecast and incremental traffic added to the baseline. LOS analysis of study intersections was then performed using the TRAFFIX model. Separate analyses were performed to determine impacts on LBNL parking, CMP roadways, transit service, and pedestrian and bicycle activity.

Projections of project impacts were based on development of a traffic growth factor for LBNL. For planning purposes, LBNL uses adjusted daily population (ADP), defined as full-time-equivalent employees plus 40 percent of authorized visitors on any given day. ("Visitors" refers to researchers, visiting faculty, etc., not casual visitors, who are generally not allowed except during special events, such as the biennial open house held by the Laboratory.) For the purpose of impact analysis, it was assumed that daily and peak-hour traffic levels (determined from actual 24-hour machine counts) are directly proportional to ADP. LBNL originally forecast a 29-percent growth in on-site ADP,[8] from 4,000 (not including approximately 375 ADP in downtown Berkeley and at

8 "On-site" in this instance refers to Lab ADP at the main hill site and at UC Berkeley, as many Lab employees at UC Berkeley drive to the main hill site.

other off-site locations) to 5,150. (This has since been reduced to a forecast of 25-percent growth in on-site ADP, from 4,000 to 5,000, consistent with the reduced scope of the 2006 LRDP that is now being proposed in response to comments from the City of Berkeley). Parking on the main hill site is proposed to be increased by a similar percentage. It was therefore assumed that LBNL traffic (and transportation by other modes) would grow by 29 percent between 2003 and 2025, absent implementation of additional programs aimed at shifting employee travel modes. As stated in the Introduction to this EIR, as a result of the reduction in the scope of the proposed project in response to comments from the City of Berkeley, the 2006 LRDP would result in an on-site ADP of 5,000 (not including ADP projections for leased spaces). This EIR thus includes a more conservative analysis that will ensure the Lab has thoroughly evaluated potential impacts associated with traffic, and the discussion that follows is based on this more conservative analysis.

For purposes of any future tiered analyses in connection with subsequent project approvals pursuant to the 2006 LRDP, the Lab will evaluate whether the traffic and circulation impacts of that later activity were examined in this program EIR. In considering traffic impacts, the Lab will include in this analysis a review of the traffic impact analysis in this EIR. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Section 15168(d)(1-3). In addition, as stated in the Introduction to this EIR, as a result of the reduction in scope of the proposed project in response to comments from the City of Berkeley, this EIR (including the Illustrative Development Scenario) will not be used as a first-tier EIR for, or to reduce or streamline the subsequent CEQA processing of, any project that, when added to other construction pursuant to this LRDP, exceeds a net total of 980,000 gross square feet of new research and support space construction or 320,000 gross square feet of demolition. In addition, also in response to comments from the City of Berkeley, the Lab has agreed to reevaluate traffic impacts by conducting an additional traffic study either 10 years following certification of this EIR, or at the time that the Lab formally proposes a project that will result in the overall development of 375 or more parking spaces pursuant to the 2006 LRDP. This provision for further traffic study is included in the Lab's proposed new TDM Program that is part of Mitigation Measure TRANS-1c and included as Appendix G to this EIR.

Trip Generation

Based on the increase in on-site parking that would be provided under the 2006 LRDP and on a count of existing traffic in and out of the three LBNL gates, development pursuant to the LRDP would generate a maximum of approximately 170 vehicle trips (150 in the peak inbound direction) during the morning peak hour and a maximum of approximately 180 vehicle trips (160 in the peak outbound direction) in the afternoon peak hour over baseline figures. Daily trip generation would increase by approximately 1,600 vehicle trips.[9]

9 Because access to the LBNL site is controlled and because the site is relatively isolated by the steep hill, it is assumed that all vehicle traffic to and from the site enters one of the LBNL gates.

A review of traffic model outputs indicates that these new vehicle trips would not increase future traffic by more than 5 percent on any of the CMP segments. Therefore, traffic generated by development pursuant to the LRDP would not exceed the level of service standard applied by the county CMA for its biennial monitoring, and impacts on the CMP roadway system would be less than significant. This analysis does not further address CMP roadways.

Intersection Impacts

Impact TRANS-1: Implementation of the 2006 LRDP would degrade level of service at certain local intersections. (Significant and Unavoidable)

Affected Intersections

With implementation of the 2006 LRDP, significant deterioration in LOS would occur at three intersections:

- Hearst Avenue at Gayley Road/La Loma Avenue (#6; signalized) would be at LOS E during both peak hours without the LRDP; the LRDP would cause the p.m. peak-hour service level to degrade to LOS F, and would increase traffic by more than 5 percent during both peak hours.
- Gayley Road at Stadium Rim Way (#7; all-way-stop-controlled) would be at LOS F during both peak hours without and with the LRDP; the LRDP would increase traffic by more than 5 percent during both peak hours.[10]
- Durant Avenue at Piedmont Avenue (#8; all-way-stop-controlled) would be at LOS E and LOS D during the a.m. and p.m. peak hours, respectively, without the LRDP; the LRDP would cause the peak-hour LOS to degrade one service level, to LOS F in the a.m. peak hour and to LOS E in the p.m. peak hour.

The intersections of Channing Way/Piedmont Avenue (#17; two-way stop) and Bancroft Way/Gayley Road-Piedmont Avenue (#20; all-way stop) would be at LOS E or F in 2025 in both the morning and afternoon peak hours without traffic from LRDP development. Because the LRDP-generated increase in traffic volumes would be less than the significance threshold of a 5-percent increase at these intersections, the project would not result in a significant impact.

All other study intersections would operate at LOS D or better in 2025 with the addition of traffic generated by development pursuant to the LRDP. Table IV.L-6 shows the results of the analysis of LRDP impacts on LOS at the 20 study intersections. Table IV.L-7 presents a comparison of 2025 LOS with and without the proposed LRDP.

[10] The EIR for the Southeast Campus Integrated Projects (SCIP), published by UC Berkeley in October 2006 (UC Berkeley, 2006), identifies a significant impact due to the Integrated Projects analyzed in that EIR, and identifies installation of a traffic signal as mitigation for that impact. Because this mitigation measure would be implemented prior to construction of the Maxwell Family Field parking structure (one of the Integrated Projects) should the SCIP be implemented, this would avoid the significant impact at this intersection due to the LBNL 2006 LRDP. However, this EIR identifies the significant impact because, for purposes of a conservative analysis, it is not presumed that the SCIP will be approved and implemented.

TABLE IV.L-6
INTERSECTION LEVEL OF SERVICE – 2025 WITH PROJECT

Intersection	Control	AM Peak LOS	AM Peak Delay (seconds)	PM Peak LOS	PM Peak Delay (seconds)
1. University Avenue at southbound Shattuck Avenue	Signal	D	39.5	C	23.5
2. Hearst Avenue at Shattuck Avenue	Signal	A	8.3	C	25.6
3. University Avenue at Oxford Street	Signal	D	40.2	C	30.6
4. Hearst Avenue at Oxford Street	Signal	B	11.8	D	50.9
5. Hearst Avenue at Euclid Avenue	Signal	B	18.5	B	18.0
6. Hearst Avenue at Gayley Road/La Loma Avenue	Signal	**E**	**68.0**	**F**	**>80**
7. Gayley Road at Stadium Rim Way	All-Way Stop	**F**	**>50**	**F**	**>50**
8. Durant Avenue at Piedmont Avenue	All-Way Stop	**F**	**>50**	**E**	**36.8**
9. Dwight Way at Piedmont Avenue	Signal	B	10.9	B	13.6
10. College Avenue at Bancroft Way	Signal	C	17.0	C	15.9
11. Durant Avenue at College Avenue	Signal	B	13.8	B	13.7
12. Telegraph Avenue at Dwight Way	Signal	B	18.3	C	34.3
13. Shattuck Avenue at Bancroft Way	Signal	B	10.6	C	22.3
14. Shattuck Avenue at Durant Way	Signal	B	14.2	C	23.7
15. Grizzly Peak Boulevard at Centennial Drive	All-Way Stop	B	11.4	D	27.3
16. Cyclotron Road at Highland Place	Two-Way Stop	C	16.0	C	16.7
17. Channing Way at Piedmont Avenue	Two-Way Stop	F	47.7	F	>50
18. Panoramic Way at Canyon Rd./Stadium Rim Way	Two-Way Stop	B	10.4	B	12.6
19. Centennial Drive at Stadium Rim Way	All-Way Stop	A	9.8	B	13.1
20. Bancroft Way at Gayley Road/Piedmont Avenue	All-Way Stop	F	>50	F	>50

Bold-face text indicates significant impact.

LOS = level of service

SOURCE: Wilbur Smith Associates, 2004.

Impact at Panoramic Way/Canyon Road-Stadium Rim Way Intersection

As noted in the comparison of Tables IV.L-5 and IV.L-6, under LRDP development, traffic would marginally increase peak-hour vehicle delay on the stop-controlled approach at the intersection of Panoramic Way/Canyon Road-Stadium Rim Way (#18; stop-controlled), although the level of service would remain at LOS B in both peak hours. LRDP traffic is estimated to add seven vehicles in the a.m. peak hour and eight vehicles in the p.m. peak hour, representing increases of 1.5 percent and 1.3 percent, respectively, over future no-project conditions.

This intersection provides the only vehicular access to the Panoramic Hill residential neighborhood that straddles the Berkeley-Oakland city limits, south of LBNL. The streets that make up this intersection are narrow and winding, with no sidewalks; residents report that cars parked along the streets sometimes obstruct parts of the already limited right-of-way, potentially impeding access for emergency vehicles and other traffic.

Although traffic generated by development that would occur under the 2006 LRDP would increase volumes at this intersection and on roadways serving the intersection – in particular, Canyon Road-Stadium Rim Way – the increase would be so small as to be nearly imperceptible.

TABLE IV.L-7
LEVEL OF SERVICE COMPARISON – 2025 WITH AND WITHOUT PROJECT

Intersection	Existing		2025–No Project		2025 w/Project	
	LOS	Delay	LOS	Delay	LOS	Delay
AM Peak Hour						
1. University Avenue at southbound Shattuck Avenue	B	19.7	D	35.7	D	39.5
2. Hearst Avenue at Shattuck Avenue	A	6.1	A	8.2	A	8.3
3. University Avenue at Oxford Street	C	29.0	D	39.5	D	40.2
4. Hearst Avenue at Oxford Street	A	10.0	B	11.7	B	11.8
5. Hearst Avenue at Euclid Avenue	B	15.4	B	17.1	B	18.5
6. Hearst Avenue at Gayley Road/La Loma Avenue	C	22.4	E	57.3	**E**	**68.0**
7. Gayley Road at Stadium Rim Way	D	26.2	F	>50	**F**	**>50**
8. Durant Avenue at Piedmont Avenue	C	17.4	E	45.5	**F**	**>50**
9. Dwight Way at Piedmont Avenue	A	9.4	B	10.9	B	10.9
10. College Avenue at Bancroft Way	B	11.8	C	16.9	C	17.0
11. Durant Avenue at College Avenue	A	9.2	B	13.4	B	13.8
12. Telegraph Avenue at Dwight Way	B	16.2	B	18.2	B	18.3
13. Shattuck Avenue at Bancroft Way	A	8.6	B	10.6	B	10.6
14. Shattuck Avenue at Durant Way	B	11.3	B	13.9	B	14.2
15. Grizzly Peak Boulevard at Centennial Drive	B	10.2	B	11.1	B	11.4
16. Cyclotron Road at Highland Place	B	12.7	B	14.5	C	16.0
17. Channing Way at Piedmont Avenue	E	38.5	F	>50	F	47.7
18. Panoramic Way at Canyon Road/Stadium Rim Way	B	10.2	B	10.3	B	10.4
19. Centennial Drive at Stadium Rim Way	A	9.2	A	9.5	A	9.8
20. Bancroft Way at Gayley Road/Piedmont Avenue	F	>50	F	>50	F	>50
PM Peak Hour						
1. University Avenue at southbound Shattuck Avenue	B	18.2	C	21.5	C	23.5
2. Hearst Avenue at Shattuck Avenue	B	14.5	C	23.9	C	25.6
3. University Avenue at Oxford Street	B	18.2	C	29.0	C	30.6
4. Hearst Avenue at Oxford Street	D	52.8	D	50.1	D	50.9
5. Hearst Avenue at Euclid Avenue	B	16.9	B	16.3	B	18.0
6. Hearst Avenue at Gayley Road/La Loma Avenue	C	24.3	E	57.2	**F**	**>80**
7. Gayley Road at Stadium Rim Way	D	34.7	F	>50	**F**	**>50**
8. Durant Avenue at Piedmont Avenue	C	17.6	D	34.2	**E**	**36.8**
9. Dwight Way at Piedmont Avenue	B	13.1	B	13.6	B	13.6
10. College Avenue at Bancroft Way	B	12.3	C	15.6	C	15.9
11. Durant Avenue at College Avenue	B	13.4	B	13.6	B	13.7
12. Telegraph Avenue at Dwight Way	C	20.2	C	34.3	C	34.3
13. Shattuck Avenue at Bancroft Way	B	12.7	C	21.8	C	22.3
14. Shattuck Avenue at Durant Way	B	14.0	C	23.4	C	23.7
15. Grizzly Peak Boulevard at Centennial Drive	C	17.7	C	23.2	D	27.3
16. Cyclotron Road at Highland Place	B	12.7	B	13.0	C	16.7
17. Channing Way at Piedmont Avenue	F	>50	F	>50	F	>50
18. Panoramic Way at Canyon Road/Stadium Rim Way	B	12.1	B	12.5	B	12.6
19. Centennial Drive at Stadium Rim Way	B	12.2	B	11.9	B	13.1
20. Bancroft Way at Gayley Road/Piedmont Avenue	F	>50	F	>50	F	>50

Bold-face text indicates significant impact.

LOS – level of service

SOURCE: Wilbur Smith Associates, 2004.

Existing a.m. and p.m. peak-hour volumes counted for this analysis were 387 and 536 vehicles, respectively. Cumulative development by 2025 is forecast to add 67 vehicles in the a.m. peak hour and 89 vehicles in the p.m. peak hour. As noted, LRDP traffic would add seven vehicles in the a.m. peak hour and eight vehicles in the p.m. peak hour, representing an increase of no more than 1.5 percent over future no-project conditions, and less than 2 percent of existing traffic volumes. The increase in peak-hour traffic due to the 2006 LRDP would amount to no more than one vehicle every 7.5 minutes, which would not be perceptible to most observers. Assuming a typical temporal distribution of traffic, the existing daily volume at this intersection is approximately 5,400 vehicles, and LRDP traffic would add perhaps 100 daily vehicles.

Given that the existing roadways, while narrow, appear to provide at least a minimum level of adequate access to Panoramic Hill, except in instances of illegal parking (an enforcement issue), and given the extremely small increment of project traffic at this intersection, it does not appear that LRDP traffic would result in a significant impact on access (including emergency vehicle access) or traffic safety at this location. None of the other study intersections or Laboratory access roads have a configuration like that at the Panoramic Way/Canyon Road-Stadium Rim Way intersection, and therefore no other locations were identified where emergency vehicle potentially could be of concern.

Mitigation Measure TRANS-1a: LBNL shall work with UC Berkeley and the City of Berkeley to design and install a signal at the Gayley Road/Stadium Rim Way intersection, when a signal warrant analysis shows that the signal is needed. The intersection would meet one-hour signal warrants for peak-hour volume and peak-hour delay under 2025 conditions with implementation of the LBNL 2006 LRDP. LBNL shall contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for a periodic (annual or biennial) signal warrant check to allow the City to determine when a signal is warranted, and for installation of the signal. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible measure(s). See also Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program.

With the implementation of this mitigation measure, the intersection of Gayley Road/Stadium Rim Way would operate at an acceptable level of service (LOS B or better under traffic signal control) during both the a.m. and p.m. peak hours. Because LBNL could not implement this measure on its own, but would need the cooperation of UC Berkeley and/or the City of Berkeley, this impact would be considered significant and unavoidable.

Mitigation Measure TRANS-1b: LBNL shall work with the City of Berkeley to design and install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows that the signal is needed. LBNL shall contribute funding, on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for a periodic (annual or biennial) signal warrant check to allow the City to determine when a signal is warranted, and for installation of the signal. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible

> measure(s). See also Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program.
>
> With the implementation of this mitigation measure, the Durant Avenue/Piedmont Avenue intersection would operate at an acceptable level of service (LOS B or better under traffic signal control) during both the a.m. and p.m. peak hours. Because LBNL could not implement this measure on its own, but would need the cooperation of the City of Berkeley, this impact would be considered significant and unavoidable.

No mitigation is available at the intersection of Hearst Avenue at Gayley Road/La Loma Avenue. This intersection is currently signalized, and physical geometric limitations constrain improvements within its current right-of-way. All four corners of this intersection are occupied by existing UC Berkeley facilities, including Foothill Student Housing, Cory Hall, and outdoor tennis courts, as well as the Founders' Rock. Analyses indicate that little can be done to mitigate future LOS conditions without acquiring additional right-of-way or prohibiting certain turning movements, such as minor left-turn movements. Although it might be possible to lengthen the existing very short dedicated right-turn lanes, the existing improvements would limit the degree to which the length of these lanes could be increased, and as such, they would not likely result in appreciable improvement in intersection operations.

> **Mitigation Measure TRANS-1c.** LBNL shall develop and implement a new Transportation Demand Management (TDM) Program to replace its existing TDM program. This enhanced TDM Program has been drafted in consultation with the City of Berkeley, and is proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The new draft proposed TDM Program is attached to this EIR as Appendix G. The proposed TDM Program includes several implementation phases tied to the addition of parking to LBNL. The final provisions of the TDM Program may be revised as it is finally adopted but will include a TDM coordinator and transportation committee, an annual inventory of parking spaces and a gate count, a study of more aggressive TDM measures, investigation of a possible parking fee, investigation of sharing services with UC Berkeley and an alternative fuels program. The new draft proposed TDM Program also includes a requirement that LBNL conduct an additional traffic study to reevaluate traffic impacts on the earliest to occur of 10 years following the certification of this EIR or the time at which the Lab formally proposes a project that will bring total development of parking spaces pursuant to the 2006 LRDP to or above 375 additional parking spaces.

Significance after Mitigation: Significant and unavoidable at (1) Hearst Avenue/Gayley Road/La Loma Avenue intersection; potentially mitigable to a less-than-significant level at (2) Gayley Road/Stadium Rim Way and (3) Durant Avenue/Piedmont Avenue intersections, but considered significant and unavoidable because LBNL could not implement the mitigation measures (installation of traffic signals, with the Lab funding its fair share of the cost) on its own, as these improvements would be under the jurisdiction of the City of Berkeley.

Project Variant. The project variant would relocate some 350 of the 375 off-site employees to the main hill site. Conservatively assuming that all relocated employees would drive to the Lab, the variant would add about nine percent more LBNL traffic to the streets of Berkeley. However, because nearly two-thirds of the relocated employees are currently located in downtown

Berkeley, and because some or all of these employees currently drive to the downtown location, only project study intersections east of Shattuck Avenue would be substantially affected. [11] In addition to the significant impact at the three intersections identified above for the LRDP, the project variant might trigger mitigation responsibilities at the added intersection of Bancroft Way at Gayley Road/Piedmont Avenue, since the project variant increase in traffic volumes would be higher than the significance threshold of a 5-percent increase in the a.m. peak hour. It should be noted that the UC Berkeley LRDP triggers mitigation responsibilities at this intersection, according to the UC Berkeley LRDP EIR.[12] The specified mitigation (intersection signalization) in the UC Berkeley LRDP EIR is sufficient to also accommodate the traffic generated by the LBNL project variant with acceptable LOS standards.

It is unlikely that all of the relocated employees would drive to the main hill site, because Berkeley Lab controls the number of employees who obtain parking permits for the hill site. Therefore, the above analysis conservatively overestimates potential traffic impacts of the variant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of traffic impacts. Individual projects identified in the Illustrative Development Scenario would contribute to degrading the LOS at three local intersections. For the reasons stated above with regard to full implementation of the LRDP, even with implementation of Mitigation Measures TRANS-1a through TRANS-1c, this impact would also remain significant and unavoidable.

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[11] The 225 LBNL employees who work in the downtown facility are currently provided with paid parking, in the interest of equity with their co-workers on the hill site. Information is not available on the current mode split of these workers, but it is assumed that if they move to the hill site, some, if not all, of any currently using transit would want to shift to automobile access due to the lesser convenience of transit service to the hill site. To avoid underestimating impacts, it was assumed for the traffic analysis that all 350 of the displaced employees would drive to their new work location on the hill site.

[12] Mitigation Measure TRA-7 p. 4.12-53 of the UC Berkeley LRDP Draft EIR, call for the University to "work with the City of Berkeley to design and, on a fair share basis, install a signal at the Bancroft Way/Piedmont Avenue intersection, and provide an exclusive left-turn lane and an exclusive through lane on the northbound approach."

Transit Impacts

Impact TRANS-2: Implementation of the 2006 LRDP would result in minor increases in transit ridership. (Less than Significant)

Table IV.L-8 presents an estimate of the increase in LBNL employees commuting by modes other than private automobile. Because LBNL controls automobile commuting via the parking permit process, and parking supply and transit services have changed little since the time of the 2003 parking survey, it is assumed that the survey provides a reasonable representation of current behavior. As shown in Table IV.L-8, the 2006 LRDP would have the greatest impact on BART ridership, with approximately 17 outbound trips during the p.m. peak period. Based on the distribution of LBNL employees, about 50 percent (eight to nine trips) would be on the Concord line; the other BART lines would handle two to four new p.m. peak trips each. For AC Transit, fewer than five new trips are forecast for all lines serving the LBNL shuttle stops. The small increment of transit trips generated by the LRDP would result in a less-than-significant impact on transit service.

TABLE IV.L-8
ESTIMATED INCREASE IN PERSON-TRIPS BY MODES OTHER THAN AUTOMOBILE

		AM Peak Hour			PM Peak Hour		
Mode	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Walk	38	8	1	9	1	9	10
LBNL Shuttle	113	23	3	26	3	26	29
Telecommute	6	1	0	1	0	1	1
Bicycle	61	13	2	15	2	14	16
LBNL Shuttle & Bicycle	41	9	1	10	1	9	10
BART	77	16	2	18	2	17	19
AC Transit	12	3	0	3	0	3	3
Other Bus	11	2	0	2	1	2	3

SOURCE: Wilbur Smith Associates, 2004

Mitigation: None required.

Project Variant. In order to accommodate an additional 350 employees on the main hill site without any additional parking beyond that proposed with the project, the Lab would have to increase the number of employees using alternative travel modes beyond that assumed for the project (i.e., non-auto travel would have to increase as a share of employee travel, compared to current conditions). This shift in travel mode would necessitate that non-auto commuters increase from the current approximately 39 percent to approximately 44 percent, a change that would be consistent with the LRDP's goals of increasing the use of alternative travel modes and enhancing the internal pedestrian environment on the hill site. LBNL's Environmental Sustainability Policy explicitly calls for enhancing the Lab's shuttle service. Measures for achieving this shift are outlined in the draft Berkeley Lab TDM Program, included in Appendix G to this EIR.

The resulting increase in use of alternative travel modes, assuming it were implemented, would increase use of public transit among lab commuters, including use of BART and AC Transit, by about 1.5 percentage points (from approximately 11 percent to about 12.5 percent). This would result in one to two additional commuters on each mode listed in Table IV.L-8, except for the Lab's shuttle, on which travel would increase by about four peak-hour passengers, compared to future with-project conditions. These changes would not result in substantially greater impacts on transit service than would occur with implementation of the LRDP non-variant condition.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of transit impacts. Individual projects identified in the Illustrative Development Scenario would generate additional transit trips. For the reasons stated above with regard to full implementation of the LRDP, this impact would be less than significant.

Impact TRANS-3: Implementation of the 2006 LRDP would result in an increase in ridership on LBNL shuttle buses, including additional demand for bicycle service on the inbound shuttles, potentially causing overcrowding on the shuttle buses or an inability by bicyclists to use the shuttle buses with their bicycles. (Significant; Less than Significant with Mitigation)

As shown in Table IV.L-8, it is estimated that the LRDP would increase ridership on LBNL shuttles by up to about 40 people (of which ten would have bicycles) during the a.m. and p.m. peak hours. That would represent the highest increase in non-automobile travel modes, and could adversely affect the availability of seats (and bicycle racks) on shuttle buses. In the absence of prescribed levels of shuttle bus service and provision of bike racks on shuttle buses, this is a significant impact. With implementation of Mitigation Measure TRANS-3 this impact would be less than significant.

> **Mitigation Measure TRANS-3:** LBNL shall develop and maintain a transportation plan designed to ensure that the current balance of transportation modes is maintained. This plan shall include 1) maintaining the same (or lesser) ratio of parking permits and parking spaces to average daily population (ADP), and 2) ensuring that levels of shuttle bus service and provision of bike racks on shuttle buses are sufficient to accommodate projected demand.

Implementation of the above measure would reduce impacts on LBNL's own shuttle bus service (and its ability to accommodate bicycle commuters) to a less-than-significant level.

> **Significance after Mitigation:** Less than significant.

Project Variant. As noted under Impact TRANS-2, implementation of the variant would necessarily result in an increase in non-auto travel, because the Lab's constrained parking supply would not allow for most relocated employees to drive to work. Therefore, impacts on the LBNL shuttle would be about 13 percent greater under the project variant than under the proposed project. Implementation of Mitigation Measure TRANS-3 would reduce the impact to a less-than-significant level.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on shuttle bus service. Individual projects identified in the Illustrative Development Scenario could increase ridership on LBNL shuttle buses**.** For the reasons stated above with regard to full implementation of the LRDP, with implementation of Mitigation Measure TRANS-3, this impact would be less than significant.

Parking Impacts

Impact TRANS-4: Implementation of the 2006 LRDP would increase parking demand but would provide additional parking that would be adequate to meet this demand. (Less than Significant)

Parking off-site is not a reasonable option for LBNL employees, due to the cost and time limitations of such parking in the vicinity of the LBNL site and most LBNL shuttle stops. LBNL plans to increase on-site parking in approximate proportion to the anticipated increase in ADP.[13] Thus, the LRDP would not conflict with LBNL's current policies supporting alternative transportation, in that modes other than vehicle travel are expected to carry approximately the same share of LBNL employees and visitors as at present. Therefore, implementation of the 2006 LRDP would have a less-than-significant impact on parking capacity.

Mitigation: None required.

Project Variant. The additional 350 staff who would be added to the LBNL hill site under the project variant would increase parking demand beyond the practical capacity of the parking supply at LBNL, assuming the same travel patterns as exist at present. As described in Impact TRANS-2, because no additional parking would be provided under the variant, increased use of

[13] As noted in Chapter III, Project Description (Table III-5), the current effective ratio of ADP to hill site parking spaces is approximately 1.9. With the increase in ADP of 1,000 and the addition of 500 parking spaces, the ratio of ADP to parking spaces would remain at 1.9.

alternative travel modes would be consistent with the Lab's policy direction, including objectives and policies explicitly contained in the 2006 LRDP. Therefore, it is assumed that the future parking supply would be adequate to serve Lab staff and visitors under implementation of the variant and this impact of the project variant would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of parking impacts**.** Individual projects identified in the Illustrative Development Scenario could increase parking demand**.** For the reasons stated above with regard to full implementation of the LRDP, and given the Lab's draft TDM Program for maintaining or decreasing demand levels, this impact would be less than significant.

Impacts on Pedestrian and Bicycle Facilities

Impact TRANS-5: Implementation of the 2006 LRDP would marginally increase potential traffic conflicts with pedestrians or bicyclists. (Less than Significant)

Implementation of the LBNL LRDP would not substantially increase hazards due to design features or incompatible uses, or create unsafe conditions for pedestrians or bicyclists. The primary impact of the Plan would be a marginal increase in the overall amount of traffic that pedestrians and bicyclists must negotiate. This would be a less-than-significant impact.

Mitigation: None required.

Project Variant. As noted under Impact TRANS-2, the analysis of the project variant assumes that implementation of the variant would result in increased use of alternative travel modes, which would include increased bicycle use, including by bicyclists who also use the LBNL shuttle. LRDP strategies to encourage bicycle use and increase bicycle storage racks and shower facilities would be implemented under the project variant as well as under the project. Impacts on bicycles and pedestrians would slightly increase under the project variant, compared to impacts under the proposed project, but this potentially incremental increase in bicycle- and pedestrian-vehicle conflicts would not be significant because of the relatively small magnitude of the overall bicycle and pedestrian trips.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on pedestrian and bicycle facilities. Individual projects identified in the Illustrative Development Scenario could marginally increase potential traffic conflicts with pedestrians or bicyclists. For the reasons stated above with regard to full implementation of the LRDP, this impact would be less than significant.

Construction-Period Impacts

Impact TRANS-6: Construction[14] of new facilities proposed under the 2006 LBNL LRDP would temporarily and intermittently increase traffic volumes and parking demand above current conditions. (Less than Significant)

Construction activities would occur intermittently at different sites on the LBNL hill site throughout the period over which the LRDP would be implemented. Construction activity would not occur continuously during the entire LRDP period, although there could be periods of overlapping construction activity at more than one location on the LBNL site. Although the related impacts at any one location would be temporary (i.e., would not result in long-term degradation in operating conditions on project roadways), construction of individual projects under the proposed LRDP could cause short-term adverse effects on the local traffic conditions in and around the LBNL area. The intensity and nature of the construction activity would vary over the multi-year construction period, and the range of adverse impacts to traffic flow and parking conditions would similarly vary. Adverse construction-related transportation impacts would primarily relate to temporary increases in traffic volumes on area roadways.

Construction projects generate truck trips for a variety of purposes throughout the construction schedule, including excavation, material deliveries, concrete pours, and other activities. The excavation phase of a construction project typically generates the highest daily and peak hour truck volumes. The specific number of excavation truck trips per day is directly related to the amount of material to be removed from the site, the project schedule, and other site factors that may limit the frequency of truck trips. Demolition, construction, and renovation activities would generate an average annual total of about 4,000 one-way truck trips, with an estimate peak annual total of about 10,000 one-way truck trips; the peak volume assumes overlapping construction and/or demolition activity occurring on more than one project during a given year. The peak annual truck traffic volume would average approximately 40 truck trips per day, based on a five-day work week, over the course of a peak construction year. Based on the EIR for a recently proposed building at LBNL, truck traffic could be concentrated on “peak-peak” days during

[14] For the purposes of this EIR, the term “construction,” unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

periods when, for example, excavated soil might be removed from the LBNL site; in such instances, there could be times when as many as 65 one-way construction truck trips might be made to and from the LBNL hill site daily (LBNL, 2003). However, even such levels of truck activity (i.e., up to one truck every 6.5 minutes between 9:00 a.m. and 4:00 p.m.), which would not be expected to last for more than a few weeks at a time, would not cause significant traffic delays, and the number of construction trucks would be too small to result in any adverse change in off-peak levels of service. The primary impacts from construction truck traffic would include a temporary and intermittent reduction of roadway capacities due to the slower movements compared to passenger vehicles.

The construction workforce on 2006 LRDP projects would primarily generate auto commute trips. The number of trips would vary with the size and type of project under construction. Based on the current level of construction on the UC Berkeley campus and in the City of Berkeley, construction-related commute trips could be already reflected in the existing traffic volumes used for the analysis of operational impacts (see Impact TRANS-1 above).

Construction-related traffic would cause a temporary and intermittent lessening of the capacities of area roadways because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles. Contractors would be required to implement standard Best Management Practices in order to mitigate any short-term construction-related transportation impacts. These requirements would be formalized as Best Management Practices under LBNL's *Construction Standards and Design Requirements,* Division I (Contractor Specifications). Generally, these practices include implementation of a traffic control plan, such as measures (e.g., advance warning signs, flaggers to direct traffic, and advance notification of interested parties about the location, timing, and duration of construction activity) to maintain safe and efficient traffic flow during the construction period. These measures would somewhat lessen the adverse construction-related impacts on traffic flow. Therefore, the effect of increased traffic volumes associated with construction activities at the LBNL site would be minor to moderate, depending on the intensity of the construction activity and the traffic volumes on area roads used by construction-related vehicles during the construction period. With implementation of Best Management Practices, the effect on traffic conditions would be less than significant.

Berkeley Lab routinely undertakes "best practices" in construction management to limit otherwise potentially adverse construction-related impacts. The following construction best practices would be incorporated into contract specifications and management oversight for all subsequent development projects that would proceed pursuant to the 2006 LRDP.

Best Practice TRANS-6a: Early in construction period planning, LNBL shall meet with the contractor for each construction project to describe and establish best practices for reducing construction period impacts on circulation and parking in the vicinity of the project site.

Best Practice TRANS-6b: For each construction project, LBNL shall require the prime contractor to prepare a Construction Traffic Management Plan that will include, but will not necessarily be limited to, the following elements:

- Proposed truck routes to be used, consistent with the City truck route map.
- Construction hours, including limits on the number of truck trips during the a.m. and p.m. peak traffic periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m.), if conditions demonstrate the need.
- A parking management plan for ensuring that construction worker parking results in minimal disruption to surrounding uses.

Best Practice TRANS-6c: LNBL shall manage project schedules to minimize the overlap of excavation or other heavy truck activity periods that have the potential to combine impacts on traffic loads and street system capacity, to the extent feasible.

Construction planning typically begins two years before physical construction and considers every aspect of the job, including the provision of safety, mission support, access, and circulation. In addition, construction planning anticipates and attempts to mitigate potentially affected Lab employees or operations in the vicinity of the construction so as not to disrupt necessary Lab business. In addition, construction planning includes consideration of environmental and regulatory elements of each project. (Environment, health, and safety considerations relevant to construction and demolition operations are discussed in Section IV.F, Hazards and Hazardous Materials, of this EIR.) Construction activities usually include the need for adjacent lay-down areas for equipment, supplies, and fabrication activities. Construction workers on-site usually park nearby if such parking is available; if it is not, parking is often provided in remote areas of the Lab or other arrangements can be made.

Mitigation: None required.

Implementation of the routine construction "best practices" noted above, which would be instituted in LBNL's *Construction Standards and Design Requirements*, Division I (Contractor Specifications) would ensure that construction-period traffic and parking impacts would remain less than significant.

Project Variant. The project variant would not result in any change in building or facility construction, compared to the proposed project, and therefore construction-period traffic impacts would be as described above.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of construction impacts. Individual projects identified in the Illustrative Development Scenario could temporarily and intermittently increase traffic volumes above current conditions. For the reasons stated above with regard to full implementation of the LRDP, this impact would be less than significant with implementation of the routine “best practices” described above.

Impact TRANS-7: Traffic associated with construction of new facilities proposed under the 2006 LBNL LRDP could contribute to the degradation of pavement on Berkeley streets. (Less than Significant)

The truck trips generated by LRDP-related construction would cause incremental damage and wear to roadway pavement surfaces along the haul routes. The degree to which this impact would occur depends on the roadway’s design (pavement type and thickness) and its current condition. Freeways and state routes, such as I-80 and SR 123 (which is the state highway designation for San Pablo Avenue), are designed to handle a mix of vehicle types, including heavy trucks, and thus, the project’s impact would be negligible. However, local roadways, such as Hearst Avenue and Oxford Street, are generally not designed to accommodate heavy vehicles, and truck travel on these roads could adversely affect the pavement condition.

The potential effect of truck traffic on a roadway can be evaluated by calculation of the roadway’s traffic index (TI). The TI is a logarithmic scale that measures the estimated total accumulated traffic loading from bus and heavy truck traffic. The TI value is used to determine the paving material(s) and thickness of material(s) required to adequately support the anticipated traffic load over the lifetime of a roadway.

Typically, TI ratings of 7.0 to 9.0 are calculated for roadways that are not expected to carry appreciable amounts of truck traffic. Higher TI values of 9.0 to 10.0 are typical of major arterial roadways with heavy truck traffic, and values of 10.0 or more are common for freeways and freeway ramp systems. The effects on pavement life from passenger cars, pickups, and two-axle, four-wheel trucks are generally considered to be negligible.

To evaluate the potential project impact on roadway condition and maintenance, the estimated TI for current and project conditions was calculated for roadway segments on the proposed project haul routes. The TI was calculated in accordance with the procedures specified in the Caltrans *Highway Design Manual* on the basis of a 20-year roadway design period (the standard period used by Caltrans) and average daily bus and heavy truck traffic volumes (Caltrans, 2006 and Marks, 2006). A summary of the TI calculations for roadways on the project haul route is presented in Table IV.L-9.

Current bus and heavy truck traffic volumes on the proposed project haul routes reveal that TI values range between 9.7 and 10.7. As Table IV.L-9 shows, the project would increase the estimated TI for all the roads on the proposed haul route by one-tenth of a point except Oxford Street, where the TI increase would be two-tenths of a point. The Caltrans *Highway Design Manual* recommends that TI values be calculated to the nearest 0.5, and that “the determination of the TI closer than 0.5 is not justified.” Therefore, for purposes of this analysis, a calculated

TABLE IV.L-9
CALCULATED TRAFFIC INDEX (TI) FOR PROJECT HAUL ROUTES [a]

Roadway	Existing	Existing plus Project
Hearst Avenue Between Oxford and Euclid	9.8	9.9
Oxford Street Between Hearst and University	9.7	9.9
University Avenue Between San Pablo and Sacramento	10.7	10.8
University Avenue Between Martin Luther King and Shattuck	10.5	10.6

[a] Traffic Indices in this table represent values calculated on the basis of existing and project truck traffic volumes, and Equivalent Single-Axles Load factors in the Caltrans Highway Design Manual.

SOURCE: ESA (2006) and the Caltrans *Highway Design Manual* Traffic Index methodology (2006).

differential of less than 0.5 is considered a less-than-significant effect. Because LRDP-related construction truck traffic is estimated to increase the TI by substantially less than 0.5, the impact of LRDP-generated construction truck traffic would be less than significant.

The results of the preliminary evaluation indicate that an asphalt overlay over the current roadway would likely not be needed in order for the streets analyzed to accommodate the additional truck traffic resulting from LRDP-related construction.

Mitigation: None required.

Project Variant. The project variant would not result in any change in building or facility construction, compared to the proposed project, and therefore construction-period impacts on roadway wear would be as described above.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of construction impacts. For the reasons stated above with regard to full implementation of the LRDP, the impacts of individual project construction on roadway wear would be less than significant.

IV.L.3.5 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex—housing the Bevatron accelerator—although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Additional projects currently underway at UC Berkeley, described in Section VI.C of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis includes Berkeley Lab and areas proximate to the Lab within the City of Berkeley where travel demand generated by implementation of the 2006 LRDP could combine with demand from cumulative development to adversely affect intersection levels of service or other forms of travel. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.L-23) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact TRANS-8: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding development in Berkeley and nearby communities that could affect the study intersections, would contribute to a degradation of level of service at local intersections. (Significant and Unavoidable)

Projects considered under the 2006 LBNL LRDP and the UC Berkeley 2020 LRDP, as well as residential development taking place throughout the proximate LBNL vicinity, would combine to increase traffic volumes at area intersections. Taken together, these projects could result in a significant cumulative impact on traffic conditions. For vehicular traffic, cumulative conditions are the same as the future "with project" conditions, because these conditions already account for future baseline conditions that include all development foreseen under the general plans of each of the jurisdictions as well as the UC Berkeley 2020 LRDP.

As shown in Table IV.L-7, the number of intersections operating at an unacceptable level of service (LOS E or F) would increase from two intersections under existing conditions to five intersections under 2025 cumulative (i.e., "2025 with project") conditions. Increased traffic generated by the 2006 LRDP would represent more than five percent of the total intersection volumes at three intersections under cumulative conditions, i.e., at Hearst Avenue at Gayley Road/La Loma Avenue, Gayley Road at Stadium Rim Way, and Durant Avenue/Piedmont Avenue. The percent increase associated with the proposed LBNL LRDP would make a considerable contribution to the overall cumulative impact at these three intersections.

The project's contribution to transit ridership (except on the Lab's own shuttle buses) would be so small, as described above under Impact TRANS-2, as to be less than the daily variation in ridership on any given operator's routes. Therefore, the project could not be seen to contribute considerably to any future cumulative impact on public transit, should such a cumulative effect occur.

The project would not contribute considerably to cumulative impacts on parking or pedestrian and bicycle conditions because the effects of the 2006 LRDP would be limited, in general, to the LBNL hill site itself; that is, impacts of the project would not combine with impacts of other development in regard to these issues.

The EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) finds that cumulative transportation impacts would be consistent with the transportation impacts identified in the UC Berkeley 2020 LRDP EIR (UC Berkeley, 2006). Because those impacts are assumed as part of the cumulative development assumptions incorporated into this section, no additional cumulative transportation impacts would result from the LBNL 2006 LRDP in combination with cumulative development.[15]

> **Mitigation Measure TRANS-8:** LBNL shall implement Mitigation Measure TRANS-1a (work with UC Berkeley and the City of Berkeley to design and install a signal at the Gayley Road/Stadium Rim Way intersection; LBNL would contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, to install the signal) and Mitigation Measure TRANS-1b (work with the City of Berkeley to design and install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows that the signal is needed; LBNL would contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, to install the signal and for monitoring to determine when a signal is warranted).
>
> With the implementation of these mitigation measure, the intersections of Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue would operate at LOS B or better during both the a.m. and p.m. peak hours.
>
> As explained earlier, the intersection of Hearst Avenue at Gayley Road/La Loma Avenue is currently signalized, and physical geometric limitations constrain improvements within its current right-of-way. Analyses indicate that little can be done to mitigate future LOS conditions without acquiring additional right-of-way or prohibiting certain turning movements, such as minor left-turn movements. Therefore, no mitigation is available for cumulative impacts on this intersection.
>
> **Significance after Mitigation:** Traffic impacts were found to be significant and unavoidable at (1) Hearst Avenue/Gayley Road/La Loma Avenue intersection. Traffic impacts were found to be potentially mitigable to less-than-significant levels at (2) Gayley Road/Stadium Rim Way and (3) Durant Avenue/Piedmont Avenue intersections, but considered significant and unavoidable because LBNL could not implement mitigation measures on its own, as these improvements would be under the jurisdiction of the City of Berkeley.

15 The SCIP EIR identifies a significant cumulative traffic impact at the intersection of Bancroft Way/Piedmont Avenue. The contribution of traffic generated by the LBNL 2006 LRDP to cumulative conditions at this intersection is identified herein as a significant cumulative impact.

Project Variant. The project variant would result in traffic impacts substantially similar to the traffic impacts that would result from the 2006 LRDP development**.** The cumulative traffic impacts of the project variant would therefore be significant and unavoidable as described above.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of cumulative traffic impacts. A future project under the LRDP such as conceptually portrayed in the Illustrative Development Scenario, when combined with other projects under the LRDP and other development as discussed above, would also, for the reasons stated above, result in a cumulative traffic impact that would be significant and unavoidable at the Hearst Avenue/Gayley Road/La Loma Avenue intersection, and potentially mitigable to a less-than-significant level at Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue intersections but considered significant and unavoidable because LBNL could not implement mitigation measures on its own, as these improvements would be under the jurisdiction of the City of Berkeley**.**

IV.L.4 References – Transportation/Traffic

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IV.M. Utilities, Service Systems, and Energy

IV.M.1 Introduction

This section addresses the potential impacts on water supply systems, wastewater disposal systems, storm drainage systems, solid waste disposal systems, and energy systems that could result from implementation of the proposed 2006 LRDP. An expanded discussion of the existing and proposed on-site stormwater drainage system is included in Section IV.G, Hydrology and Water Quality.

IV.M.2 Setting

IV.M.2.1 Water Supply

The East Bay Municipal Utility District (EBMUD) water supply system consists of a network of reservoirs, aqueducts, treatment plants, and distribution facilities. The water supply system extends from its primary water source, the Mokelumne River, in the Sierra Nevada mountain range, to water treatment plants or to reservoirs[1] within its service area, and ultimately to residences and businesses in the East Bay. On average, 90 percent of the water delivered by EBMUD comes from the Mokelumne River watershed, with the remaining 10 percent originating as runoff from local watersheds within the service area.

EBMUD provides the high pressure water supply for LBNL at two separate connections. The primary connection is to EBMUD's Shasta Pressure Zone, which provides water service to customers within an elevation range of 900 to 1,050 feet and has a two-million-gallon capacity. The second connection is to the Berkeley View Pressure Zone, which provides water service to customers within an elevation range of 1,050 to 1,250 feet and has a one-million-gallon capacity. The Lab receives its water through a 12-inch meter on Campus Drive in the Shasta Pressure Zone and a 6-inch meter on Summit Road from the Berkeley View Pressure Zone.

On-Site Water System

High pressure water is distributed throughout LBNL by an extensive piping layout providing domestic and fire protection water to the site. The Lab's system also supplies make-up water for cooling towers, irrigation water, and water for other on-site miscellaneous uses. The system includes fire hydrants, fire department connections, and sprinkler services to almost all LBNL buildings. In many areas of the site, the LBNL water delivery system is looped and equipped with block valves, which can be used to isolate portions of the system for repair or replacement while still maintaining full service to most facilities. With the Lab's loop distribution design, other portions of the system can continue to be served from the other side of the loop.

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1 EBMUD's East Bay service area includes five reservoirs: Briones, Chabot, Lafayette, San Pablo, and Upper San Leandro.

All utility systems within the Laboratory's boundary are owned and operated by the Laboratory. In addition, the sanitary sewer line from the Strawberry Gate to the Strawberry Outfall – located outside the Laboratory boundary – is owned and operated by LBNL.

The Lab conducts periodic inspections of its water distribution system and has installed back-flow prevention devices in accordance with the Uniform Plumbing Code to ensure the purity of the domestic water supply system. Periodic pressure tests are performed to ensure that the system operates at appropriate pressure levels.

Due to differences in elevation at the Lab, there are five main pressure zones operating at the nominal pressure of 70 pounds per square inch (psi).[2] The water distribution system is entirely a gravity system, except for the emergency fire protection system. Most of the existing pipe in the system is either cement mortar lined and coated steel pipe with welded joints or ductile iron pressure pipe with mechanical joints. The pipe has been designed and installed to resist forces caused by earth movement due to slides and/or earthquakes, and/or located to avoid potential unstable earth areas.

There are two sources of water supply into the Laboratory. One source is from a 12-inch diameter pipe line originated from EBMUD Shasta Reservoir, which has a capacity of over 2 million gallons. The bottom of the reservoir is at elevation 1,149 feet above mean sea level (MSL). The second source is a 6-inch line from EBMUD Berkeley View Reservoir, which has a capacity of over 3 million gallons. The bottom of the Berkeley View Reservoir is at elevation 1,317 feet above MSL. Since the Laboratory's elevation is at an average of elevation of 840 feet above MSL, the flow capacity of these two lines combined will be approximately 5,000 gallons per minute. There is a connection between the Lab’s water supply and UC Berkeley’s supply outside of the UC Botanical Garden.

To supplement the water supply provided by EBMUD, LBNL operates and maintains three 200,000-gallon water storage tanks on-site for emergency water supply in the event of service interruption from EBMUD. One tank is located near Building 82 in the Central Research Area, one is located at Building 68 in the Grizzly Operations Support Area, and the third tank is located above Building 85 in the East Canyon Area. The tanks at Buildings 82 and 68 are each equipped with a diesel-powered pump and automatic controls to pressurize LBNL’s water distribution system if EBMUD service is interrupted. The tank located near Building 85 will continue to maintain water flow for the fire protection system during emergencies by gravity. In normal operation, water is slowly circulated from the LBNL system through the 200,000-gallon tanks so they are always filled with potable water and the full 600,000 gallons are always available if required. The first two of the emergency water systems were installed around 1979. The third tank was completed in December 2003.

In the event that one or both of the water supply pipelines from EBMUD to Berkeley Lab are damaged, the storage tanks and fire pumps on-site would maintain water supply and water pressure to every building and fire hydrant on site. (There are 64 fire hydrants located for

2 Pounds per square inch: the amount of operating pressure.

optimum service distribution throughout the Laboratory. Each hydrant has one four-inch and two 2.5-inch valve connections.) Each pump would start automatically when it senses a drop in water pressure in the distribution system. Such pump activation is announced via the site-wide fire alarm system at the fire dispatch center. The pump can also be manually started or stopped from the fire dispatch console or at the control panel at each of the pump houses.

Water Demand

During 2003, total annual water consumption at LBNL was approximately 41.6 million gallons. Of the total water demand, personal water use, or water used directly by the Lab population for consumption and sanitary purposes, accounted for slightly less than 50 percent of the total demand, or 20.5 million gallons. Process water, used for research, cooling, heating, industrial, cleaning, construction, and landscaping purposes, accounted for the balance of total water use (LBNL, 2004).

Over time, the demand for water at LBNL has been decreasing due to improved efficiency on-site. Between 1990 and 2003, total annual water use, including both personal water and process water, decreased from approximately 78.6 million gallons to 41.6 million gallons. This represents about a 47-percent reduction in water use. During this time, the building gross square footage at LBNL increased by about nine percent (from approximately 1.62 million gross square feet [gsf] to 1.76 million gsf). This improved efficiency has been achieved in several ways. Over the past 15 years, all of the Lab's "once through" cooling systems have been eliminated. Several cooling towers have been retrofitted with non-chemical water treatment systems, increasing the cooling tower operating cycles and thereby reducing water replacement need. All of the commodes at LBNL have been either replaced with low-flow models or adjusted for low-flow operation, all shower heads have been replaced with low-flow shower heads, and all wash basin faucets have been replaced with low-flow aerators.

Pipe Replacement Needs

All major cast iron pipe mains at the LBNL site have been replaced. There are still some cast iron pipe laterals from some of the mains to various buildings. All new pipes are either ductile iron pipes with Class 50 pipe wall thickness, PVC conforming to AWWA C900, pressure class 250 or polyethylene, class 200. Within the next 20 years, the existing 12-inch diameter pipe that is cement mortar lined and coated will require replacement. The pipe was installed in early 1960. The line is currently provided with an Impressed Current Cathodic Protection System. It is expected that the pipe will likely fail within the next 20 years either due to the failing Cathodic Protection System or due to other unforeseeable conditions. The Lab intends to replace the pipe if it fails.

IV.M.2.2 Wastewater

EBMUD provides wastewater treatment services to parts of Alameda and Contra Costa counties along the east shore of the San Francisco Bay, including the project site. In the project area, wastewater is collected and conveyed via the City of Berkeley's public sewer system and EBMUD-operated interceptor sewers to the regional wastewater treatment facility located southwest of the Interstate 80 and Interstate 580 interchange in Oakland. Wastewater is collected by 29 miles of interceptor lines that move wastewater from about 1,400 miles of sewers owned and operated by the jurisdictions served.

Currently, EBMUD's wastewater treatment facility has an average annual daily flow of 77 million gallons per day (mgd) during dry weather conditions (EBMUD, 2001). During wet weather, the treatment plant accepts more flow;[3] the plant has a sustainable primary treatment[4] capacity of 320 mgd, and a maximum secondary treatment[5] capacity of 168 mgd. After treatment, wastewater is discharged off the East Bay shore into the San Francisco Bay via a one-mile-long deep-water outfall line.

On-Site Wastewater Collection System

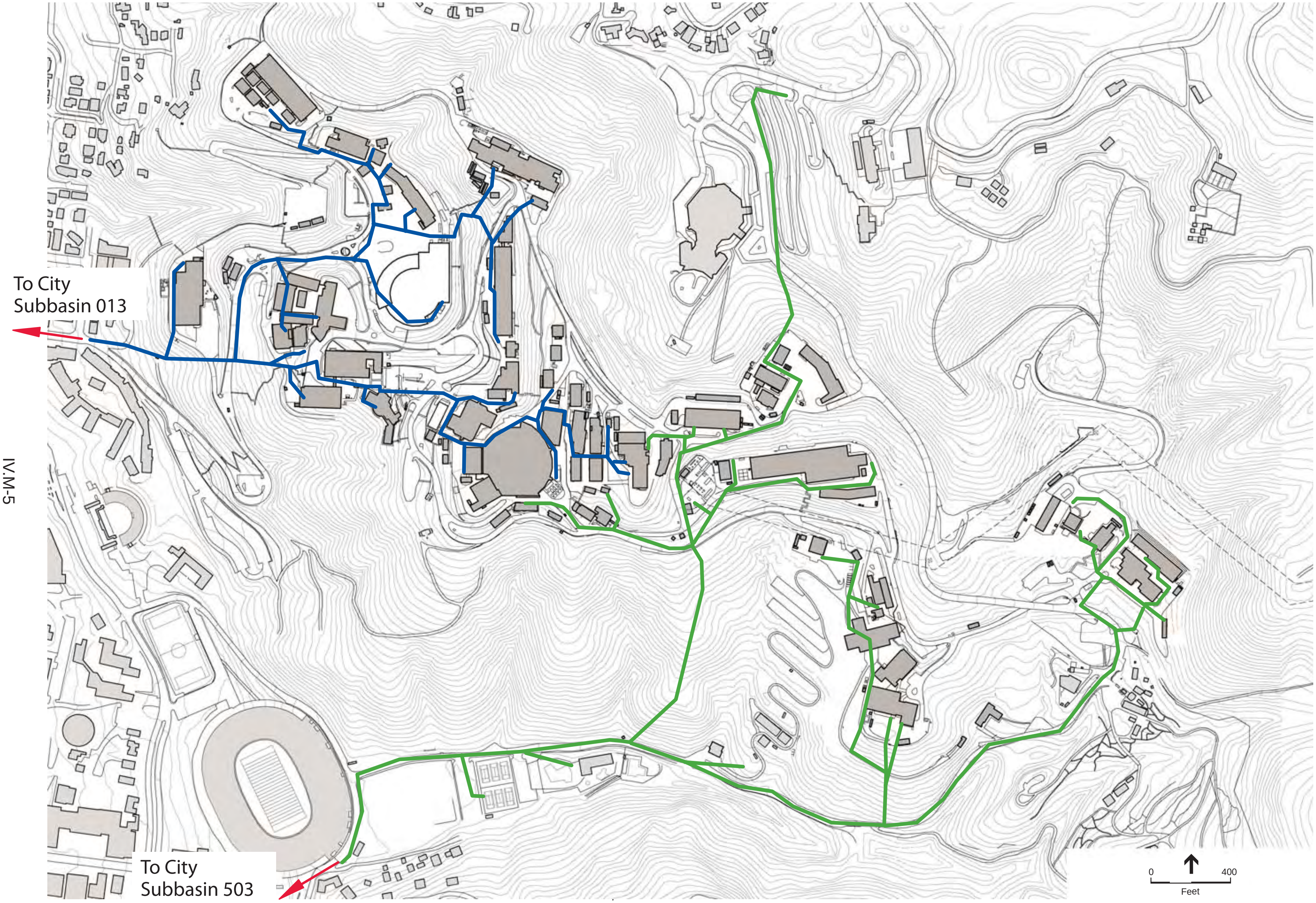
Wastewater at the Lab is carried via a gravity flow system, owned and operated by LBNL and eventually discharged to the City of Berkeley's public sewer system through two monitoring stations, one located at Hearst Avenue (Hearst Monitoring Station) and the other at Centennial Drive in Strawberry Canyon (Strawberry Monitoring Station). The monitoring stations measure the volume of the effluent on a continuous basis. In addition, samples of the effluent are taken at regular intervals and evaluated for radioactivity and other constituents mandated by EBMUD.

The Lab's effluent from the Hearst Monitoring Station flows to just above the intersection of Highland Place and Cyclotron Road, where it ties into the City of Berkeley's sewer system at City sanitary sewer sub-basin 17-013. Effluent from the Strawberry Monitoring Station flows through a UC Berkeley sewer line, which ties into the City of Berkeley's system at a manhole near the intersection of Stadium Rim Road and Canyon Road, located southeast of Memorial Stadium at City sanitary sewer sub-basin 17-503. Part of the effluent from this monitoring station originates from UC Berkeley facilities, including the Lawrence Hall of Science as shown in Figure IV.M-1. The City of Berkeley's sewer system transports the effluent from both monitoring stations to EBMUD's north interceptor sewer and then to the treatment facility in Oakland.

Infiltration and Inflow

The main concern with sewer flow in the project vicinity and region-wide in the EBMUD system is the infiltration and inflow (known as "infiltration / inflow" or "I/I") of stormwater into the sanitary sewer system attributed to the poor condition of aging sewer pipes. LBNL has acted to address infiltration/inflow problems in its system through a concerted sewer infrastructure upgrade program. A plumbing maintenance and upgrade effort has been undertaken during the past 15 years by LBNL, along with installation of water-saving devices and systems, to substantially lower average sewer flows. These ongoing efforts have reduced both peak wet

3 Storage basins provide plant capacity for a short-term hydraulic peak of 415 mgd.
4 *Primary* treatment involves preliminary treatment (screening) and sedimentation (the removal of solid particles from suspension by gravity).
5 *Secondary* treatment involves biological treatment of wastewater to remove remaining organic matter.



SOURCE: Lawrence Berkeley National Laboratory (2006)

LBNL 2006 Long Range Development Plan . 201074

Figure IV.M-1
Existing Sanitary Sewer Lines at LBNL

weather as well as average sewer flows by well over half.[6] Moreover, LBNL's peak wet weather infiltration/inflow rate is less than half that of the City of Berkeley, and it is only approximately 10 percent of that found in the EBMUD service district on average. LBNL continues to seek ways to reduce both water consumption and sewage generation.

Wastewater Generation

Annual wastewater generation at LBNL is approximately 38 million gallons, with personal wastewater accounting for approximately half and process water accounting for the other half. While sewer flows vary widely according to the time of day and time of year, the Lab's approximate peak daily flow is about 274,000 gallons per day (gpd) during dry weather conditions and 821,000 gpd during peak wet weather conditions (LBNL, 2004). At the Hearst Monitoring Station, the average wastewater flow is about 50,000 gpd and can range from 30,000 to 100,000 gpd. At the Strawberry Monitoring Station, LBNL's approximate average daily flow is 100,000 gpd and can range from 40,000 to 120,000 gpd. These ranges represent averages throughout the year. The effluent flow at the Strawberry Monitoring Station also includes the UC Berkeley Hill Campus area buildings, which contribute about half of the amount measured.

Sewer System Conditions and Upgrades

LBNL currently pays EBMUD for assessed sewer services. The University has also contributed to the City of Berkeley's sewer upgrade program, which is intended to increase wet weather flow capacity and decrease infiltration/inflow conditions. The City of Berkeley's infiltration/inflow correction program was initiated in 1987 and includes rehabilitation or replacement of 50 percent of the City's existing system over 30 years, as well as installation of 12 miles of new sewer lines to accommodate overflow conditions by the year 2007. By 1999, over 25 percent of the planned replacement and rehabilitation had been completed and 10 miles of the proposed 12 miles of new sewer lines had been installed. A 22-mile interceptor line along Adeline Street, completed in 1992, now conveys wet weather flow to EBMUD's storage and treatment facilities. The City's infiltration/inflow correction program allows for a 20 percent increase in the base wastewater flow due to changes in land use or population (City of Berkeley, 2001).

Sanitary sewage from LBNL's eastern portion (and upstream UC Berkeley Hill Campus buildings) generally is routed into pipes exiting the Lab at Centennial Drive. The LBNL Centennial Drive sanitary sewer flows into the UC Berkeley sewer on Centennial Drive and then into City of Berkeley's sanitary sewer sub-basin 17-503.[7] This sub-basin also collects wastewater from other sources, including the City of Oakland Panoramic Hill area. From sewer sub-basin 17-503, LBNL's wastewater continues to flow through City sanitary sewer basin 17 to basin 15 and into EBMUD-operated interceptor sewers and its treatment facility.

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6 The ratio of water consumption to wastewater generation for developed areas is typically 1:1. According to existing data at LBNL, wastewater generation is about 95 percent of water consumption. Thus the reduction in sewer flows at LBNL has been comparable to reductions in water consumption, both about 47 percent between 1990 and 2003.

7 A "sub-basin" is a small-flow sanitary sewer collection area established by the City of Berkeley. Several sub-basins flow into a larger "basin," which collects effluent and directs it to the EBMUD sanitary sewer waste treatment plant.

Sanitary sewer sub-basin 17-503 is constrained around Dwight Avenue during peak wet weather conditions. The problem is cross-jurisdictional, since sub-basin 17-503 receives wastewater flow from both the City of Berkeley and the City of Oakland. Additionally, the sewer pipes cross both the Hayward fault and numerous landslide areas, making them vulnerable to damage. The constricted portion of sub-basin 17-503 runs beneath Prospect Road, which is the principal automobile access to a large portion of the Panoramic Hill neighborhood. Rehabilitation of or improvement to this portion of sewer line would be difficult as it would obstruct access, egress, and emergency service to this residential area. Resolving the capacity problem with the City of Berkeley sanitary sewer sub-basin 17-503 is not scheduled to be addressed in the near term (LBNL, 2004; Yee, 2006).

Effluent from LBNL's western portion generally flows into sub-basin 17-013 by way of the Hearst Monitoring Station. The sanitary sewer lines on Hearst Avenue are relatively new and in good condition, and they flow directly into the interceptor on Shattuck Avenue. Sub-basin 17-013 is not currently constrained during peak wet weather flows, and it is expected to have future wet weather capacity to meet LBNL's growth needs during the term of the 2006 LRDP (LBNL, 2004).

IV.M.2.3 Stormwater Drainage

In order to control stormwater runoff, a drainage system has been installed that discharges into the north fork of Strawberry Creek to the north and to Strawberry Creek itself to the south. The existing system provides for runoff intensities expected in a 100-year maximum-intensity storm. An expanded discussion of the existing and proposed on-site stormwater drainage system is included in Section IV.G, Hydrology and Water Quality.

The LBNL storm drain system is a gravity-fed network of open and culverted drainage conveyances, running generally east to west. Drain pipes range from 4-inch diameter to 36-inch diameter and consist of metal, PVC, concrete and tile pipe. Run-on (i.e., water draining onto the site from off-site locations) enters the site via open drainage channels and combines with runoff from the LBNL site. The combined drainage is conveyed across developed portions of the Lab via underground piping, and is then discharged at established open drainage channels of the Strawberry Watershed.

IV.M.2.4 Non-Hazardous Solid Waste

The LBNL Facilities Department provides a range of non-hazardous waste management services to LBNL staff and visitors. As a government-owned facility operated through contract by the University of California, LBNL must comply with waste minimization reporting requirements issued by the Department of Energy (DOE), the State of California, the University of California, and LBNL itself. Appendix F of the contract between the University of California and DOE for the operation of LBNL contains a performance measure pertaining to sanitary waste reduction. The goal, consistent with the overall DOE performance measure, was to reduce the amount of routine solid sanitary waste going to land disposal by 67 percent by the end of Fiscal Year (FY) 2004, using the amount of solid sanitary waste sent to land disposal in 1993 as the baseline.

LBNL had achieved a waste reduction of about 85 percent as of FY 2004, thereby exceeding the FY 2004 goal. The reductions were achieved through waste segregation and recycling efforts, and through a composting and mulching program.[8] The plant material recycling program has resulted in a 10-percent reduction in LBNL solid waste. During 2004, LBNL generated 1,070 tons of recycled waste and 210 tons of disposed waste.[9]

Richmond Sanitary (waste and recycling contractor) collects non-hazardous, non-recyclable solid waste, including construction waste, generated at LBNL, and transports it to a collection station in Richmond, California. The waste is baled and then delivered to the Altamont Landfill in Livermore, California. Recycled waste, including aluminum, glass, paper, landscape materials, and recyclable wood, is collected separately by Richmond Sanitary and transported to its recycling facility in Richmond. There, recycled materials are sorted, baled, and transferred to recycling vendors.

IV.M.2.5 Electricity

Electrical power at the Lab is purchased from the Western Area Power Administration and delivered by the Pacific Gas and Electric (PG&E) transmission system to the Lab's Grizzly Substation located adjacent to Building 77. PG&E delivers power to LBNL on two overhead 115-kilovolt (kV), 3-phase, 60-Hertz (Hz) transmission lines with a joint capacity of approximately 100 megawatts (MW). Both of these transmission lines feed power from PG&E's El Sobrante switching station to the Grizzly Substation. The Grizzly Substation consists of two DOE-owned 120/12 kV power transformers with a combined capacity of 100 MW. This substation is for the exclusive use of LBNL. In addition, LBNL's power can be supplied from UC Berkeley's Hill Area Substation, located adjacent to the Grizzly Substation.

The main power distribution system at the Lab consists of a 12.47-kV underground system with smaller substations and transformers that reduce voltage to 480/277 volts (V) or 208/120 V. The 12.47-kV distribution system has dual primary feeders to provide reliable power. Certain buildings are equipped with special voltage regulation in order to ensure that critical experiments will not be disrupted by transient voltage within the system. Total electrical power consumption at LBNL in 2003 was 74,500 megawatt hours (MWh).

LBNL also has a number of stationary and portable emergency power generators. These generators start automatically in the event of a power failure and are used to provide an emergency power supply for certain critical services (e.g., for laboratory exhaust fans, exit lights, the fire station, Radio Communications Facility, and the Health Services Building) and other important activities at LBNL. The generators are powered either by diesel, gasoline, or natural gas fuel. The total generating capacity of these emergency generators is approximately 6,250 kilowatts. Diesel-powered generators greater than 50 horsepower (approximately

[8] Data are compiled from waste and recycling quantities reported by LBNL's sanitary waste contractors. Routine solid sanitary waste does not include wastes generated during site renovations, site restoration, or other one-time activities, or recycled waste.

[9] "Recycled" solid waste includes paper, glass, metals, and other materials that are recycled and transported off-site for reuse, and "disposed" solid waste includes personal and process non-hazardous waste solids that are disposed in off-site sanitary landfills.

35 kilowatts) require an operating permit from the Bay Area Air Quality Management District. LBNL has 22 such generators (23 with the inclusion of the Molecular Foundry generator), and all but one are rated in the tens to hundreds of kilowatts of power capacity. The remaining generator is rated at 2000 kilowatts of generating capacity. All permitted generators are limited in the number of hours per year of use for maintenance and testing operations. All of the permitted generators are allowed unlimited use during conditions that meet the regulatory definition of an emergency.

IV.M.2.6 Natural Gas

Natural gas is used at the Lab for heating all buildings, equipment, operations, and some experimental uses. The natural gas supply is provided by the Defense Fuel Supply Center in Oregon and delivered by the PG&E system. The LBNL natural gas system receives its supply from a 6-inch PG&E line operating at 50 pounds per square inch gauge (psig).[10] The point of delivery is a meter vault in the hillside area above Cyclotron Road and below Building 88. A 6-inch gas line operating at 13.5 psig distributes high pressure natural gas from PG&E's metering vault to the buildings throughout the Laboratory, with the exception of Buildings 73 and 73A. Buildings 73 and 73A receive their gas supply directly from a PG&E supply line that travels up Centennial Drive to the UC Berkeley Botanical Garden. Building pressure generally ranges from 0.25 to 1.25 psig. The piping for the LBNL on-site natural gas system consists of two types: coated and wrapped steel, and polyethylene. The system includes pipes, valves, fittings, pressure-reducing stations, earthquake emergency shut-off valves, meters, and appurtenances. Current (2003) natural gas usage is approximately 1.6 million Therms, or about 20,720 British thermal units (Btu) per gross square foot.

IV.M.2.7 Other On-Site Utilities

LBNL also employs building-specific or site-wide utilities specific to Lab research or specialized equipment. These utilities include:

> Compressed Air. The Laboratory-wide compressed air system provides compressed air to laboratories and shops for cleaning or driving hand-held tools and vacuum pumps. Berkeley Lab has approximately 11,000 linear feet of compressed air pipeline.
>
> Low-Conductivity Water. The Laboratory low-conductivity water system provides low-conductivity water to laboratory buildings. The water is primarily used to provide cooling of sensitive equipment for research purposes, including for accelerator magnet amplifiers. This system has approximately 11,500 linear feet of pipeline.
>
> Treated Water. The treated water system is a closed-loop cooling water system that provides cooling water to laboratory buildings for cooling equipment, chillers, and other purposes. This system has approximately 4,500 linear feet of pipeline.
>
> Purified Water. Purified water systems are necessary for some scientific research. These systems are installed locally either at the point of use in specific laboratories or at individual building sites. There is no Laboratory-wide purified water system.

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[10] Pounds per square inch gauge: the amount of operating pressure.

De-Ionized Water. De-ionized water systems are necessary for some scientific research. These systems are installed locally either at the point of use in specific laboratories or at individual building sites. There is no Laboratory-wide de-ionized water system.

IV.M.2.8 State Regulatory Environment

Planning for water supply and distribution, solid waste disposal, and energy are regulated at the state level. Specific regulations that would be relevant to implementation of the 2006 LRDP are described below.

Water Supply and Distribution

Senate Bill (SB) 610, codified as Sections 10910-10915 of the California Public Resources Code, requires local water providers to conduct a water supply assessment for projects proposing over 500 housing units or equivalent usage. The local water suppliers must also prepare an Urban Water Management Plan (UWMP) to guide planning and development in the water supplier's service area.

Solid Waste Disposal

The California Integrated Waste Management Act of 1989, or Assembly Bill (AB) 939, established the Integrated Waste Management Board, required the implementation of integrated waste management plans, and also mandated that local jurisdictions divert at least 50 percent of all solid waste generated, beginning January 1, 2000.

Energy

Buildings constructed after June 30, 1977 must comply with standards identified in Title 24 of the California Code of Regulations. Title 24 requires the inclusion of state-of-the-art energy conservation features in building design and construction, including the incorporation of specific energy-conserving design features, use of non-depletable energy resources, or a demonstration that buildings would comply with a designated energy budget.

IV.M.2.9 Local Plans and Policies

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land that is owned or controlled by The Regents of the University of California. As such, LBNL is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies in the Berkeley and Oakland general plans.

Berkeley General Plan

Berkeley General Plan policies relevant to the proposed 2006 LRDP include the following:

Water Supply and Distribution

Berkeley General Plan policies pertaining to water supply and distribution include:

> Policy EM-26 Water Conservation. Promote water conservation through City programs and requirements.
>
> *Actions*:
>
> B) Consider participation in the East Bay Municipal Utility District's East Bay-shore Recycled Water Project to make recycled water available for irrigation and other non-potable uses.
>
> Policy EM-31 Landscaping. Encourage drought-resistant, rodent-resistant, and fire-resistant plants to reduce water use, prevent erosion of soils, improve habitat, lessen fire danger, and minimize degradation of resources.

Wastewater

Berkeley General Plan policies that relate to wastewater collection and treatment include:

> Policy EM-24 Sewers and Storm Sewers. Protect and improve water quality by improving the citywide sewer system.

Stormwater Drainage

Berkeley General Plan policies related to stormwater management include:

> Policy EM-23 Water Quality in Creeks and San Francisco Bay. Take action to improve water quality in creeks and San Francisco Bay.
>
> *Actions*:
>
> D) Restore a healthy freshwater supply to creeks and the Bay by eliminating conditions that pollute rainwater, and by reducing impervious surfaces and encouraging use of swales, cisterns, and other devices that increase infiltration of water and replenishment of underground water supplies that nourish creeks.
>
> E) Ensure that new development pays its fair share of improvements to the storm sewerage system necessary to accommodate increased flows from the development.
>
> F) Coordinate storm sewer improvements with creek restoration projects.
>
> Policy S-27 New Development: Use development review to ensure that new development does not contribute to an increase in flood potential.
>
> *Actions*:
>
> C) Require new development to provide for appropriate levels of on-site detention and/or retention of stormwater.

D) Regulate development within 30 feet of an exposed streambed as required by the Preservation and Restoration of Natural Watercourses (Creeks) Ordinance.

Solid Waste

The Berkeley General Plan identifies policies regarding solid waste including:

> Policy EM-7 Reduced Wastes. Continue to reduce solid and hazardous wastes.
>
> Policy EM-8 Building Reuse and Construction Waste. Encourage rehabilitation and reuse of buildings whenever appropriate and feasible in order to reduce waste, conserve resources and energy, and reduce construction costs.
>
> Policy EM-10 Materials Recovery and Remanufacturing. Support and encourage serial materials recovery and remanufacturing industries.
>
> Policy EM-11 Biodegradable Materials and Green Chemistry. Support efforts to phase out the use of long-lived synthetic compounds, such as pesticides and vehicle anti-freeze, and certain naturally occurring substances which do not biodegrade. Encourage efforts to change manufacturing processes to use biodegradable materials, recycle manufactured products, reuse byproducts, and use "green" products.

Energy

Berkeley General Plan policies relating to energy conservation include:

> Policy EM-35 Energy-Efficient Design. Promote high-efficiency design and technologies that provide cost-effective methods to conserve energy and use renewable energy sources.
>
> Policy EM-36 Energy Conservation. Continue to implement energy conservation requirements for residential and commercial buildings at the time of sale and at time of major improvements.
>
> Policy EM-39 Business Energy Conservation. Encourage all businesses to implement energy conservation plans.
>
> Policy EM-40 Market Support. Support the market for energy-efficient technologies and services.

Oakland General Plan

The Oakland General Plan Land Use and Transportation Element was approved in March 1998. Policy language is focused on economic development (Industry and Commerce policies), Transportation and Transit-Oriented Development, Downtown, the Waterfront, and the Neighborhoods, as well as Housing. The following policy is applicable to utilities:

> Policy I/C1.9 Locating Industrial and Commercial Area Infrastructure. Adequate public infrastructure should be located within existing and proposed industrial and commercial areas to retain viable existing uses, improve the marketability of existing vacant or underutilized sites, and encourage future user and development of these areas with activities consistent with the goal of this Plan.

The Open Space, Conservation and Recreation (OSCAR) Element, adopted in 1996, addresses the management of open land, natural resources, and parks in Oakland. Policies relevant to the proposed project are discussed below.

Water Supply and Distribution

OSCAR Element policies pertaining to water supply and distribution include:

> Policy CO-4.1 Water Conservation. Emphasize water conservation and recycling strategies to meet future demand.
>
> Policy CO-4.2 Drought-Tolerant Landscaping. Require the use of drought tolerant plants to the greatest extent possible and encourage the use of irrigation systems which minimize water consumption.
>
> Policy CO-4.4 Water-Conscious Development Patterns. Encourage regional development patterns which make environmentally sound use of water resources.

Wastewater

OSCAR Element policies pertaining to wastewater include:

> Policy CO-5.3 Control of Urban Runoff. Employ a broad range of strategies, compatible with the Alameda Countywide Clean Water Program, to: (a) reduce water pollution associated with stormwater runoff; (b) reduce water pollution associated with hazardous spills, runoff from hazardous material areas, improper disposal of household hazardous wastes, illicit dumping, and marina “live-aboards”; and (c) improve water quality in Lake Merritt to enhance the lake’s aesthetic, recreational, and ecological functions.
>
> Action 5.3.11 Improved Sewer Collection and Treatment. Reduce water pollution from sanitary sewer collection and treatment systems, including wastewater collection lines and the regional treatment plant. Continue the systemwide improvement program to correct infiltration and inflow problems in the East Bay Municipal Utility District and Oakland sewer systems.

Also applicable are Policy CO-4.1 and Policy I/C1.9, above.

Stormwater Drainage

OSCAR Element policies pertaining to stormwater drainage include Policy CO-5.3, Control of Urban Runoff, above.

Solid Waste

The Oakland General Plan does not identify policies regarding solid waste or recycling.

Energy

OSCAR Element policies pertaining to energy include:

> Policy CO-13.3 Construction Methods and Materials. Encourage the use of energy-efficient construction and building materials. Encourage site plans for new development which maximize energy efficiency.

IV.M.3 Impacts and Mitigation Measures

IV.M.3.1 Significance Criteria

The impact of the proposed LRDP on utilities, energy, and service systems would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the state CEQA Guidelines and the UC CEQA Handbook:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing entitlements and resources, or if new or expanded entitlements are needed;
- Result in the need for increased chilled water or steam generation capacity or major distribution improvements;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; and
- Not comply with applicable federal, state, and local statutes and regulations related to solid waste.

IV.M.3.2 Impact Assessment Methodology

The environmental impact analysis for utilities, energy, and service systems in this EIR begins with an assessment of existing utility use and infrastructure services at LBNL. The projected utilities and infrastructure services demand generated by subsequent development projects pursuant to the LRDP are then calculated and compared to existing usage to determine the net increase. Finally, the projected utility usage is compared to the capacity. Impacts on stormwater drainage facilities are addressed in Section IV.G, Hydrology and Water Quality, of this EIR. Moreover, Berkeley Lab does not employ either chilled water or steam generation systems, and therefore these issues are not discussed below.

IV.M.3.3 2006 LRDP Principles, Strategies, LBNL Design Guidelines

2006 LRDP Principles and Strategies

The 2006 LRDP proposes four fundamental principles that form the basis for the development strategies provided for each element of the LRDP. The two principles most applicable to utilities-related aspects of new development are to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship" and to "Build a safe, efficient, cost-effective scientific infrastructure capable of long-term support of evolving scientific missions."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP (see Chapter III, Project Description for further discussion, and see Appendix B for a full listing of principles, strategies, and design guidelines). Development strategies set forth in the 2006 LRDP that are applicable to utilities include the following:

- Protect and enhance the site's natural and visual resources, including native habitats, riparian areas, and mature tree stands by focusing future development primarily within the already developed areas of the site;
- Provide flexibility in the identification of land uses and in the siting of future facilities to accommodate the continually evolving scientific endeavor;
- Increase development densities within areas corresponding to existing clusters of development to preserve open space, and enhance operational efficiencies and access;
- To the extent possible site new projects to replace existing outdated facilities and ensure the best use of limited land resources;
- To the extent possible, site new projects adjacent to existing development where existing utility and access infrastructure may be utilized;
- Site and design new facilities in accordance with University of California Presidential Policy for Green Building Design to reduce energy, water, and material consumption and provide improved occupant health, comfort, and productivity;
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory;
- Utilize native, drought-tolerant plant materials to reduce water consumption; focus shade trees and ornamental plantings at special outdoor use areas;
- Minimize impervious surfaces to reduce storm water run-off and provide landscape elements and planting to stabilize slopes, and reduce erosion and sedimentation;
- Maintain a safe and reliable utility infrastructure capable of sustaining the Laboratory's scientific endeavors;
- Consolidate utility distribution into centralized utility corridors that generally coincide with major roadways;

- Ensure that utility infrastructure improvements accommodate future facility expansion and alterations in the most cost-effective means possible; and
- Design infrastructure improvements to embody sustainable practices.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following The Regents' consideration of the LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provide the following specific planning and design guidance relevant to the utilities-related aspects of new development:

- Minimize impacts of disturbed slopes;
- Respect view corridors;
- Create a cohesive identity across the Lab as a whole by following established precedents for new landscape elements;
- Provide appropriate site lighting for safety and security;
- Segregate public entries and paths from service entries and paths where feasible;
- Reduce the amount of impermeable surfaces at the Lab;
- Create buildings that are flexible, modular, and expandable; and
- Organize service functions to minimize conflicts and visual impacts.

IV.M.3.4 Impacts and Mitigation Measures

Impact UTILS-1: Implementation of the proposed 2006 LRDP would increase the demand for water. (Less than Significant)

During 2003, total water consumption at LBNL was approximately 41.6 million gallons. Of this amount, personal water use accounted for slightly less than 50 percent of the total demand, or 20.5 million gallons. Process water accounted for the balance majority of total water use (LBNL, 2004). As stated in the Introduction to this EIR, as a result of the reduction in scope of the proposed project in response to comments from the City of Berkeley, this EIR assumes the 2006 LRDP would result in 2.42 million gsf of occupiable (research and support) building space at the Lab's hill site. The impact analysis below regarding water demand is based on a more conservative projected use of water associated with the original proposal of 2.56 million gsf of potential development. This more conservative analysis will ensure that the Lab has thoroughly evaluated potential impacts associated with water demand. Using this more conservative analysis, implementation of the 2006 LRDP would generate an estimated water demand of approximately 56.5 million gallons per year (see Table IV.M-1). This represents an increase of about 36 percent, or 14.9 million gallons. Of this total increase, the annual demand for personal water would increase by approximately 27 percent and the demand for process water would increase by about 45 percent. The percentage of water demand associated with personal water use would decrease slightly, to about 46 percent, as compared with baseline (2003) conditions, in which personal water use accounted for slightly less than 50 percent of total demand.

TABLE IV.M-1
EXISTING AND PROJECTED ANNUAL WATER DEMAND

Water (million gallons)	Current Use (2003) 1,760,000 gsf	Projected Use (2025) 2,560,000 gsf[c]	Increase under Project
Personal[a]	20.5	26.0	5.5
Process[b]	21.1	30.5	9.4
Water (total)	41.6	56.5	14.9

[a] "Personal" water is water used directly by Lab population for consumption and sanitary purposes.
[b] "Process" water is water employed for research, cooling, heating, industrial, cleaning, construction, and landscaping uses.
[c] Gross square footage under originally proposed 2006 LRDP. Gross square footage under currently proposed 2006 LRDP would be less (2,420,000 gsf).

gsf – gross square feet

SOURCE: LBNL (2003).

The 2006 LRDP as currently proposed would provide for 660,000 gsf of net new occupiable space at the hill site, or approximately 17.5 percent less net new occupiable space than the 2006 LRDP as originally proposed (800,000 gsf) (see Chapter III, Project Description, for details). Accordingly, it is estimated that the additional water demand would be reduced by approximately a like amount.

Pursuant to Sections 10910-10915 (SB 610)[11] of the California Water Code, LBNL submitted a request to EBMUD to prepare a water supply assessment (WSA) for the proposed project.[12]

EBMUD submitted the WSA to LBNL in a letter dated November 23, 2004 and confirmed by EBMUD on February 23, 2006. EBMUD confirmed that the project's estimated water demand is accounted for in EBMUD's water demand projections, as published in the 2000 Urban Water Management Plan (EBMUD, 2004). The proposed project would not change EBMUD's 2020 water demand projection, nor would it result in a new significant increase in water use beyond what EBMUD has projected for the region. Therefore, the proposed project would not result in the need for new or expanded water entitlements. The WSA was based on the increased level of

[11] The LBNL water supply system is a private water system and does not meet the definition of a city or county system as defined in the California Water Code Sections 10910-10915. However, LBNL will voluntarily comply with the Water Code as delineated in these sections, including the water supply assessment provision.
[12] A "project," as defined by SB 610, includes proposals for new residential use over 500 units, retail use over 500,000 square feet, office use over 250,000 square feet, hotel/motel use over 500 rooms, industrial use over 40 acres or 650,000 square feet, a mixed-use project including any use as large as the above, or any project that would demand water greater than the equivalent of 500 dwelling units.

potential development under the LRDP as described in the Notice of Preparation. As the 2006 LRDP as currently proposed includes a reduced amount of potential development compared to the originally proposed LRDP (by about 17.5 percent of net new occupiable space), the conclusion that the project would not result in the need for new or expanded water entitlements applies equally to the reduced 2006 LRDP as currently proposed.

As further stated in the WSA, during periods of multiple-year drought conditions, EBMUD's studies indicate that, with current water supply and projected 2020 demand, deficiencies in water supply of up to 67 percent could occur. The project's water demand would contribute to this projected deficiency in supply during drought periods (EBMUD, 2004). To address projected deficiencies in water supply during future drought conditions, EBMUD recommends implementation of water conservation measures at the project site to avoid significantly affecting its system.

New buildings constructed under the 2006 LRDP would install water conservation devices such as low-flow plumbing fixtures and water-saving appliances; other devices and new technology (e.g., drip irrigation, re-circulating cooling systems, etc.) would be employed where practicable to further water conservation. Additionally, landscaping introduced to the project site as a result of the 2006 LRDP would include drought-tolerant plant materials with a long-term goal to wean the majority of the plant materials off the irrigation system and allow them to naturalize.

The 2006 LRDP also includes various system upgrades intended to improve reliability and reduce water loss due to outdated, deteriorating pipelines. Improvements include the replacement of selected existing water distribution lines.

The on-site water delivery system at LBNL and connection to off-site pipes are sized for firefighting, which requires roughly 20 times larger capacity than the infrastructure necessary for water delivery for daily use. Thus, existing infrastructure is adequate for future development and redevelopment under the 2006 LRDP.[13] Based on the discussion above, the project would generate a less-than-significant impact with respect to demand for water services.

Mitigation: None required.

Project Variant. Under the project variant, the adjusted daily population (ADP) on the hill site would increase by approximately 1,350. The project variant does not propose additional building space on the hill site, and staff consolidated from off-site locations would be accommodated within the total 2.42 million gsf (660,000 gsf new) of net new occupiable (research and support) building space proposed under the current 2006 LRDP.

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13 Normal water use at LBNL, including cooling tower use, ranges from 10 gpm to a peak of 167 gpm. LBNL has conducted fire hydrant testing on a biannual basis to determine the available water supply capacity. The flow test usually consisted of two hydrants flowing simultaneously with an average of 1,800 gpm flow from one hydrant. The total flow from two hydrants is 3,600 gpm. Hence the 20 times larger capacity is being maintained.

While the ADP increase under the project variant (1,350) would be approximately 35 percent higher than the ADP increase under the currently proposed LRDP program (1,000), the increase in water demand and other utility demand is estimated at about 10 percent because the project variant would not result in additional building space at the hill site. The projected increase in water demand associated with the project variant is approximately 10 percent, or 1.49 million gallons per year, higher than projections for the 2006 LRDP.

The project variant would result in an incremental increase in water demand compared to the 2006 LRDP, and it is expected that EBMUD would have available capacity to accommodate the project variant. Therefore, the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. The scenario is based on the amount of development originally proposed in the LRDP, and the Water Supply Assessment is also based on that originally proposed amount of potential development, so the scenario remains an appropriate and conservative basis for the evaluation of impacts to water supply. Individual projects as identified in the Illustrative Development Scenario would not result in significant impacts related to water supply for the reasons described above.

Impact UTILS-2: Implementation of the proposed 2006 LRDP would generate additional wastewater, requiring system improvements to ensure that additional wastewater flows from the Lab are directed into unconstrained sub-basins. (Significant; Less than Significant with Mitigation)

LBNL sewers are maintained in very good condition. During wet weather conditions, LBNL generates about two to three times as much wastewater as the amount generated on a peak dry weather day. For comparison purposes, the City of Berkeley generates about six to seven times as much wastewater on wet days as the peak dry weather wastewater flow. Increased wastewater flow during wet weather conditions is attributed to the infiltration and inflow of stormwater into the sanitary sewer system, and results in the EBMUD treatment facility receiving about seven to 10 times as much wastewater on wet days as on a peak dry weather day.

Based on the more conservative analysis, as described above (i.e., based on the originally proposed 2006 LRDP), the annual wastewater generation at LBNL would increase by about 13.5 million gallons, or by about 36 percent, with the implementation of the 2006 LRDP. Daily wastewater generation would be about 346,000 gpd during peak dry weather conditions, and would reach a peak of 893,000 gpd during wet weather (see Table IV.M-2).

TABLE IV.M-2
EXISTING AND PROJECTED WASTEWATER GENERATION

Wastewater (million gallons)	Current Use (2003) 1,760,000 gsf		Projected Use (2025) 2,560,000 gsf[c]		Increase under Project	
Total Wastewater (million gallons/year)	37.5		51.0		13.5	
Personal[a] Wastewater (million gallons/year)	18.5		23.5		5.0	
Process[b] Wastewater (million gallons/year)	19.0		27.5		8.5	
Daily Wastewater (gallons per day)	Peak dry weather 274,000	Peak wet weather 821,000	Peak dry weather 346,000	Peak wet weather 893,000	Peak dry weather 72,000	Peak wet weather 72,000

a “Personal” wastewater is sanitary sewer water generated directly by Lab population from consumption and sanitary activities.
b “Process” wastewater is sanitary sewer water generated from research, cooling, heating, industrial, and cleaning activities.
c Gross square footage under originally proposed 2006 LRDP. Gross square footage under currently proposed 2006 LRDP would be less (2,420,000 gsf).

gsf – gross square feet

SOURCE: LBNL (2003).

The City of Berkeley’s infiltration/inflow correction program set a maximum allowable peak wastewater flow from each sub-basin within the city, and EBMUD agreed to design and construct wet weather conveyance and treatment facilities to accommodate these flows. EBMUD prohibits discharge of wastewater flows above the allocated peak flow for a sub-basin because conveyance and treatment capacity for wet weather flows may be adversely affected by flows above the agreed limit. The Centennial Drive sewer, or sub-basin 17-503, is currently constrained during peak wet weather events. About half the existing sewage flow from LBNL entering the Centennial Drive sanitary sewer comes from LBNL and the remaining flow comes from the UC Berkeley hill area. It is unlikely that this ratio will change substantially in the future with the growth proposed under either institution’s new LRDPs; in any event, additional inflow would further aggravate the existing peak wet weather capacity constraints in sub-basin 17-503.

Independent from the LRDP program, LBNL has planned to address its contribution to the capacity issues in the City of Berkeley’s sub-basin 17-503. Although LBNL has substantially reduced its sewage flows into this sub-basin through improvements in water use efficiency and sanitary sewer system improvements, the Lab is working toward intercepting and diverting the LBNL/UC Berkeley-hill-area effluent flow before it enters the constricted portion of sub-basin 17-503. To address its planned development and increased sanitary sewer flows from the eastern area of the Lab, LBNL is working with UC Berkeley and the City of Berkeley to identify a feasible solution that would be enacted to accommodate future growth under the LRDP program. LBNL has completed a study reviewing options to divert LBNL-related sewer flow from the surcharged manhole. Options under investigation include:

1) Rerouting flow (via gravity system) upstream of the surcharged manhole through the nearby UC Berkeley Sewer System network, ultimately discharging into the Oxford Avenue sewer main and beyond;

2) Rerouting flow upstream of the surcharged manhole across LBNL property (via lift stations) and discharging into the City of Berkeley system in the vicinity of Cyclotron Road and Hearst Avenue; or

3) Diverting the Strawberry Outfall flows around the point of constriction in sub-basin 17-503 and discharging to a new tie-in at the City of Berkeley sewer system.

LBNL intends to choose one of these options and move forward with the improvement independent of the new LRDP. EBMUD anticipates having adequate dry weather capacity to treat the proposed wastewater flow from LBNL at buildout of the 2006 LRDP (EBMUD, 2003). However, it may not have capacity during wet conditions. Mitigation Measure UTILS-2 would reroute the discharge away from constrained sub-basins, and additional effluent resulting from development under the 2006 LRDP would be directed to sub-basin 17-013 and/or sub-basin 17-304, which are not constrained during wet weather conditions and have available capacity to accommodate the Lab's projected wastewater flows. Therefore, with the incorporation of Mitigation Measure UTILS-2, the implementation of the proposed 2006 LRDP would not exceed the City's sub-basin capacity.

Mitigation Measure UTILS-2: LBNL shall implement programs to ensure that additional wastewater flows from the Lab are directed into unconstrained sub-basins, as necessary and appropriate. LBNL shall continue to direct the Lab's existing western effluent flows into sub-basin 17-013. In addition, new flows at the Lab shall be directed into either sub-basin 17-013, sub-basin 17-304, unconstrained portions of sub-basin 17-503, or another sub-basin that has adequate capacity. Final design and implementation of these improvements shall be negotiated between the appropriate parties and shall undergo appropriate environmental review and approval. LBNL shall closely coordinate the planning, approval, and implementation of this mitigation with the City of Berkeley and the UC Berkeley, as appropriate.

Significance after Mitigation: Less than significant.

Project Variant. The project variant would increase the ADP at the hill site and would result in additional wastewater generation. Similar to demands for water, wastewater generation associated with the project variant is expected to increase by approximately 10 percent, or 1.35 million gallons per year, above projections for the 2006 LRDP based on the more conservative approach used in this analysis. The project variant would not result in more building space, but rather an intensification in the use of space planned under the 2006 LRDP.

As noted above, sub-basin 17-503 is constrained during wet weather, and additional wastewater flow into sub-basin 17-503 would further aggravate peak wet weather capacity constraints. EBMUD anticipates having adequate dry weather capacity to treat the proposed wastewater flow from LBNL at buildout of the 2006 LRDP (EBMUD, 2003). Because the project variant would result in an incremental increase in on-site wastewater generation compared to the 2006 LRDP, but no substantial overall increase in wastewater generation in the vicinity,[14] it is expected that EBMUD would have available capacity to accommodate the project variant. Additional wastewater generated from the project variant would be directed to sub-basin 17-013 and/or sub-basin 17-304, which are not constrained during wet weather conditions and have available capacity to accommodate the Lab's projected wastewater flows. With implementation of Mitigation Measure UTILS-2, this impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of wastewater impacts. Individual projects as identified in the Illustrative Development Scenario would generate additional wastewater. With implementation of the mitigation measure above, this impact would be less than significant for the reasons described above.

Impact UTILS-3: Development proposed under the 2006 LRDP would generate solid waste, but would not require new facilities. (Less than Significant)

The proposed 2006 LRDP would result in an increased waste stream due to an increase in operations (additional personnel and building square feet). The originally proposed 2006 LRDP would increase LBNL's adjusted daily population (ADP) from the baseline of 4,375 to 5,525. The increase in ADP would take place at the main hill site. The increase translates into an average annual growth rate of approximately 1.1 percent. This would result in an increase in disposed waste from the existing estimate of about 413 tons per year to about 520 tons per year at buildout of the LRDP (see Table IV.M-3). The amount of recycled waste generated at LBNL would also increase from the existing annual estimate of 1,592 tons to 2,006 tons. The proportion of recycled waste to disposed waste under buildout of the LRDP would remain at the existing ratio of roughly 4:1. (The currently proposed 2006 LRDP, which would increase the ADP from 4,375 to 5,375, would result in similar increases in disposed and recycled wastes.)

Currently, disposed waste from LBNL is transported to the Altamont Landfill. The Altamont Landfill has a permitted maximum daily disposal of 11,150 tons per day. Under existing conditions, LBNL disposed waste accounts for about 0.01 percent of the daily permitted disposal. Under the 2006 LRDP, the projected disposed waste would increase but would remain at roughly 0.01 percent of the daily permitted disposal. The Altamont Landfill has recently updated its

[14] The large majority of the Lab's leased space is within Berkeley and Oakland.

TABLE IV.M-3
EXISTING AND PROJECTED ANNUAL SOLID WASTE

Solid Waste	Current Use (2003) 1,760,000 gsf	Projected Use (2025) 2,560,000 gsf [c]	Increase under Project
Recycled Waste[a]	1,592 tons	2,006 tons	508 tons
Disposed Waste[b]	413 tons	520 tons	127 tons

[a] "Recycled" solid waste includes paper, glass, metals, and other materials that are recycled and transported off-site for reuse.
[b] "Disposed" solid waste includes personal and process non-hazardous waste solids that are disposed in off-site sanitary landfills.
[c] Gross square footage under originally proposed 2006 LRDP. Gross square footage under currently proposed 2006 LRDP would be less (2,420,000 gsf).

gsf – gross square feet

SOURCE: LBNL (2003).

conditional use permit, which allows for an additional capacity of approximately 40 million tons of disposal over the next 19 to 38 years (St. John, 2004). Therefore, development at LBNL attributed to the 2006 LRDP would not cause any landfill to exceed its permitted capacity and would result in a less-than-significant impact.

Mitigation: None required.

Project Variant. The project variant would increase the ADP at the hill site by 1,350, approximately 350 more than the ADP increase associated with implementation of the currently proposed 2006 LRDP. The project variant would therefore increase the waste stream from the hill site, generating approximately 10 percent, or 63.5 tons of annual waste, more than the projected increase in solid waste volume under the 2006 LRDP.

LBNL's current disposed waste accounts for about 0.01 percent of the daily permitted disposal at the Altamont Landfill. The project variant would result in an increase to approximately 0.015 percent of the daily permitted disposal at the Altamont Landfill. The Altamont Landfill has capacity for approximately 40 million tons of disposal over the next 19 to 38 years (St. John, 2004). Therefore, development at LBNL attributed to the project variant would not cause any landfill to exceed its permitted capacity and would result in a less-than-significant impact.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of solid waste generation impacts. Individual projects as identified in the

Illustrative Development Scenario would not result in significant impacts related to solid waste generation for the reasons described above.

Impact UTILS-4: On-site construction due to development proposed under the 2006 LDRP would generate construction waste and debris. (Significant; Less than Significant with Mitigation)

Development at LBNL under the 2006 LRDP would generate waste and debris over the course of the 20-year planning period. The Lab's recent construction patterns indicate there are extended periods of little or no major construction interspersed with periods when more than one medium or large construction project may be underway. For purposes of this analysis, the estimated annual peak average of construction[15] activity is analyzed, which is approximately twice the annual average, or the equivalent of two large construction projects being underway simultaneously.

Waste generated by construction-related debris is estimated at approximately 3.9 pounds per square foot of construction, and waste generated by demolition is approximately 155 pounds per square foot of demolition (U.S. EPA, 1998). Based on the recently completed EIR for LBNL's Building 49, 50 percent of construction waste would be diverted from the solid waste disposal stream, approximately five percent of resources would be reused, and approximately 25 percent of building materials would be recycled (LBNL, 2003). Construction and demolition debris would be removed from the site and disposed of at a local landfill.

Without planning for the recycling of construction and demolition waste, projects developed pursuant to the 2006 LRDP could impede the ability of the City of Berkeley to meet the waste diversion requirements of the California Integrated Waste Management Act (AB 939), and also the Altamont Landfill's capacity for solid waste could be adversely affected. Implementation of the following mitigation measure would ensure that the project would not impede the City of Berkeley's ability to meet the 50-percent diversion requirements of AB 939, and would ensure that the project's impact on the Altamont Landfill would be less than significant.

> **Mitigation Measure UTILS-4:** LBNL shall develop a plan for maximizing diversion of construction and demolition materials associated with the construction of the proposed project from landfill disposal.
>
> **Significance after Mitigation:** Less than significant.

Project Variant. The project variant and the 2006 LRDP would result in about the same new building space on the hill site. Therefore, the impact under the project variant would be the same as under the proposed LRDP. With incorporation of Mitigation Measure UTILS-4, the impact would be less than significant.

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[15] For the purposes of this EIR, the term "construction," unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts related to solid waste generation resulting from project construction. For the reasons identified above, with implementation of Mitigation Measure UTILS-4, individual projects under the Illustrative Development Scenario would not result in significant impacts related to solid waste generation resulting from project construction.

Impact UTILS-5: Development proposed under the 2006 LDRP would create additional demand for electricity and natural gas, but would not result in the construction of new or expansion of existing energy production and/or transmission facilities. (Less than Significant)

Based on the more conservative approach described above (i.e., based on the originally proposed 2006 LRDP), implementation of the 2006 LRDP would increase the demand for both electricity and natural gas by 154,380 MWh per year and about 748,098 Therms per year, respectively (see Table IV.M-4). The projected annual demand for electricity at the LRDP planning horizon is minimal (less than 0.08 percent) compared to total electricity use in the state of California, which was about 273 million MWh in 2002 (California Energy Commission, 2002). The projected demand for natural gas at LBNL is also minimal (0.02 percent), when compared to total natural gas consumption of about 12,769 million Therms in California in 2000 (California Energy Commission, 2000). Ongoing conservation efforts at Berkeley Lab include use of energy-efficient equipment, such as transformers and motors, variable frequency drives for on-demand power, and automatic climatic controls.

TABLE IV.M-4
EXISTING AND PROJECTED ANNUAL ELECTRICITY AND NATURAL GAS DEMAND

Utility	Current Use (2003) 1,760,000 gsf	Projected Use (2025) 2,560,000 gsf[a]	Increase under Project
Electricity (MWh)	74,500	228,880	154,380
Natural Gas (Therms)	1,645,816	2,393,914	748,098

[a] Gross square footage under originally proposed 2006 LRDP. Gross square footage under currently proposed 2006 LRDP would be less (2,420,000 gsf).

gsf – gross square feet; MWh – megawatt hours

SOURCE: LBNL (2003).

The delivery of additional electricity and natural gas to LBNL could be accommodated by existing infrastructure. Development under the 2006 LRDP would require specific utility connections for new buildings that would occur in existing developed areas, and would be incorporated with the construction or rehabilitation of new structures. No new structures would be developed solely for the purpose of supplying new electricity or natural gas to LBNL. The impact would be considered less than significant.

Mitigation: None required.

Project Variant. Under the project variant the ADP on the hill site would increase by approximately 1,350, rather by 1,000 as anticipated under the currently proposed LRDP. The project variant would not result in additional building space on the hill site, and LBNL staff would be accommodated within the new 660,000 gsf of occupiable (research and support) building space currently proposed under the 2006 LRDP. Because the project variant would not result in new building space, it is expected that it would result in minimal increases in the demand for electricity and natural gas at the hill site when compared to the demand generated by the 2006 LRDP. The delivery of additional electricity and natural gas to the hill site could also be accommodated by existing infrastructure, and delivery to individual buildings would be incorporated with the construction or rehabilitation of new structures.

The project variant would include ongoing energy conservation efforts at the hill site, including the continued use of energy-efficient equipment, such as transformers and motors, variable frequency drives for on-demand power, and automatic climatic controls.

For reasons noted above, the project variant would not result in significant impacts related to electricity and natural gas.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the 2006 LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts related to electricity and natural gas. Individual projects as identified in the Illustrative Development Scenario would not result in significant impacts related to electricity and natural gas supply for the reasons described above.

IV.M.3.5 Cumulative Impacts

This analysis considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex – housing the Bevatron accelerator – although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Additional projects currently underway at UC Berkeley, described in Section VI.C, Cumulative Impacts, of this EIR, are also accounted for in the cumulative analysis.

The geographic context for this cumulative analysis includes Berkeley Lab and areas proximate to the Lab within the cities of Berkeley and Oakland that rely on the same service providers as LBNL. This analysis evaluates whether the impacts of the proposed LRDP, together with the impacts of cumulative development, would result in a significant impact (based on the significance criteria on p. IV.M-14) and, if so, whether the contribution of the LRDP to this impact would be considerable. Both conditions must apply in order for the project's cumulative impacts to rise to the level of significance.

Impact UTILS-6: The proposed 2006 LRDP, in combination with other reasonably foreseeable development in the surrounding area, would contribute to cumulative demand for utilities, service systems, and energy. (Less than Significant)

The development and redevelopment proposed under the 2006 LRDP would not result in significant impacts on utilities and service systems with the incorporation of mitigation measures identified above. However, the project, in conjunction with reasonably foreseeable development at UC Berkeley's campus and in nearby communities, could result in increases in demand for utilities and energy. With respect to water supply, EBMUD has indicated that the project site and its associated water demand are accounted for in its cumulative demand projections, through planning horizon year 2020, in the 2000 UWMP.

The EIR for the UC Berkeley Southeast Campus Integrated Projects (SCIP) identifies a significant impact related to wastewater collection as a result of implementation of the Integrated Projects (UC Berkeley, 2006). Specifically, the SCIP EIR notes that the existing sanitary sewer in Bancroft Avenue may not have adequate capacity to accommodate the improvements to Memorial Stadium, and that UC Berkeley would consult with the City of Berkeley about connecting the Integrated Projects to other sewer lines that have adequate capacity. The SCIP EIR also describes the discussions underway among LBNL, UC Berkeley, and the City of Berkeley to address sanitary sewer capacity, which are described above under Impact UTILS-2 (UC Berkeley, 2006; p. 4.9-8). As described under Impact UTILS-2, LBNL intends to proceed with sanitary sewer improvements that would avoid adverse effects on constrained wastewater collection facilities, and thus implementation of the 2006 LRDP would not result in a cumulative significant impact on wastewater facilities. With implementation of Mitigation Measure UTILS-2, development under the 2006 LRDP would not contribute considerably to cumulative impacts on wastewater collection facilities, and the cumulative impact would, therefore, be less than significant. (The SCIP EIR did not identify adverse effects on other utilities, and therefore the Integrated Projects would not contribute to any other cumulative impacts.)

Other foreseeable development in the surrounding area would contribute to cumulative increases in utility and energy demand; however, new development would occur within a largely built-out urban area where utilities and service systems generally are provided. Additionally, these increases in demand attributed to other development would be addressed on a site-by-site basis by the service providers prior to approval of new development, and through CEQA review of each development project. The incremental increase in demand for utilities associated with the 2006 LRDP would not be expected to represent a substantial increase in demand for utility and service systems, and existing utility delivery systems would be expected to handle growth anticipated under the proposed LRDP. Therefore, the effect of this project in combination with other foreseeable development would not be significant, nor would the project's contribution to any cumulative effects be cumulatively considerable.

Mitigation: None required.

Project Variant: The project variant would result in impacts to utilities, service systems, and energy substantially similar to the impacts to utilities, service systems, and energy that would result from the 2006 LRDP development. The cumulative utilities, service systems, and energy impacts of the project variant would therefore be less than significant as described above.

Individual Future Project / Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of development under the 2006 LRDP. For reasons noted above with regard to implementation of the LRDP, the effect of a future project under the LRDP as identified in the Illustrative Development Scenario, in combination with other reasonably foreseeable development in the surrounding area, on the cumulative demand for utilities, service systems, and energy would not be significant, nor would its contribution be cumulatively considerable.

IV.M.4 References – Utilities and Service Systems

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CHAPTER V
Alternatives

V.A. Introduction

CEQA requires that an EIR include an evaluation of the comparative effects of "a reasonable range of potentially feasible alternatives" to the project. One of the primary criteria for selecting the alternatives to be considered is that such alternatives "would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines Section 15126.6(a)). The range of alternatives is governed by the "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice (CEQA Guidelines Section 15126.6(f)). Evaluation of a No Project Alternative and identification of an environmentally superior alternative are required. The significant effects of the alternatives shall be discussed, but in less detail than the significant effects of the proposed project (CEQA Guidelines Section 15126.6(d)).

This chapter includes the required analysis of alternatives to the project, as well as information explaining how the alternatives were selected. This chapter begins with this introduction, which lists the significant and unavoidable impacts identified in the previous chapters of the EIR, as the ability to avoid or reduce one or more of these unavoidable impacts is one of the factors considered in evaluating potential alternatives for analysis in this EIR. The second part of this introduction describes the factors that were used in selecting alternatives, and lists the alternatives that are analyzed. The sections of this chapter following the introduction are organized as follows:

- Section V.B describes several possible alternatives that were initially considered for analysis in this EIR, but that were rejected from further analysis. This section includes an explanation of the reasons that these alternatives were rejected from detailed consideration.
- Sections V.C through V.G of this chapter set forth the detailed analysis of alternatives.
- Finally, Section V.H lists the references that were used in preparing the alternatives chapter.

V.A.1 Significant and Unavoidable Impacts

As discussed in Chapter IV, implementation of the LRDP would result in the following significant and unavoidable impacts:

V.A.1.1 Aesthetics

Impact VIS-2: The proposed project could alter views of the LBNL site, and could result in a substantial adverse effect to a scenic vista or substantially damage scenic resources.

Impact VIS-3: The proposed project would alter the existing visual character of the Lab site and could substantially degrade the existing visual character and quality of the site and its surroundings.

V.A.1.2 Air Quality

Cumulative Impact AQ-6: Even though cumulative emissions of toxic air contaminants would decrease, implementation of the LBNL 2006 LRDP, in combination with other potential contributing projects, would contribute to cumulative emissions of toxic air contaminants that result in an excess cancer risk that exceeds, and would continue to exceed, 10 in one million.

V.A.1.3 Cultural Resources

Impact CUL-1: Implementation of the 2006 LRDP could cause a substantial adverse change in the significance of historical resources, as defined in CEQA Guidelines Section 15064.5, including historical resources that have not yet been identified.

V.A.1.4 Noise

Impact NOISE-1: Development under the proposed LRDP would result in temporary noise impacts related to construction and demolition activities.

Cumulative Impact NOISE-5: Development under the proposed LRDP would result in temporary contributions to cumulative noise impacts related to construction and demolition activities.

V.A.1.5 Transportation

Impact TRANS-1: Implementation of the 2006 LRDP would degrade level of service at certain local intersections.

Cumulative Impact TRANS-8: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding development in Berkeley and nearby communities that could affect the study intersections, would contribute to a degradation of level of service at local intersections.

V.A.2 Alternatives Analyzed in this EIR

The project alternatives selected for evaluation would have the potential to lessen or avoid one or more of the identified significant and unavoidable impacts of the 2006 LRDP. The alternatives addressed in this EIR were selected in consideration of one or more of the following factors:

- The extent to which the alternative would accomplish most of the basic objectives of the project (identified in Chapter III);
- The extent to which the alternative would avoid or lessen any of the identified significant adverse environmental effects of the project;
- The feasibility of the alternative, taking into account site suitability, economic viability, availability of infrastructure, consistency with regulatory limitations, and the reasonability of the project sponsor's acquiring or controlling the site;
- The appropriateness of the alternative in contributing to a "reasonable range" of alternatives necessary to permit a reasoned choice;
- The CEQA Guidelines requirement to consider a "no project" alternative as well as an "environmentally superior" alternative (CEQA Guidelines Section 15126.6); and
- The responsiveness of the alternative to requests and suggestions from the public scoping process.

This chapter discusses the following alternatives to the proposed project:

1) No Project Alternative;
2) Reduced Growth 1 Alternative;
3) Reduced Growth 2 Alternative;
4) Preservation Alternative with Non-LBNL Use of Historical Resources; and
5) Off-Site Alternative.

A description of these alternatives is provided below, as well as a discussion of their potential impacts compared to those of the proposed project. These alternatives are presented in tabular form in Table V-1, and impacts of each alternative are compared to those of the project in Table V-2.

The CEQA Guidelines suggest that an EIR briefly describe the rationale for selecting the alternatives to be discussed and identify any alternatives that were considered by the lead agency but were rejected as infeasible (Section 15126.6(c)). Alternatives examined in the initial review of potential alternatives, but rejected from further consideration because they were determined either to be infeasible or to offer no significant environmental benefits over the 2006 LRDP or the alternatives identified above, are discussed in the subsequent subsection.

Of the alternatives assessed in this EIR, the environmentally superior alternative, that is the alternative with the least environmental impact, is the No Project Alternative. Section 15126.6(e)(2) of the CEQA Guidelines directs that if the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Other than the No Project Alternative, the Reduced Growth 1 Alternative is the environmentally superior alternative, because it would reduce the significant and unavoidable impacts associated with the project more than would the other alternatives.

TABLE V-1
COMPARISON OF PROJECT AND ALTERNATIVES

	New Occupiable Building Construction (gsf)	Demolition (gsf)	Net New Occupiable Building Space (gsf)	Net New Parking Spaces	New ADP
Proposed LRDP Project	980,000	(320,000)	660,000	500	1,000
Illustrative Development Scenario[a]	*1,240,000*	*(440,000)*	*800,000*	*600*	*1,150*
No Project Alternative	455,200	(215,200)	240,000	0	375
Reduced Growth 1 Alternative	655,800	(239,600)	416,200	375	760
Reduced Growth 2 Alternative	915,000	(325,000)	590,000	375	1,025
Preservation Alternative with Non-LBNL Use of Historical Resources	980,000	(320,000)	660,000	500	1,000
Off-Site Alternative					
LBNL Hill Site	655,800	(239,600)	416,200	375	760
Richmond Field Station	383,800	0	383,800	225	390

gsf – gross square feet; ADP – adjusted daily population

[a] The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. The scenario, developed before the proposed 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, is intended to provide a conservative basis for the analysis of environmental impacts, and actual development that is proposed for approval and construction pursuant to the LRDP is reflected under “Proposed LRDP Project” in the table.

TABLE V-2
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	Project	No Project	Reduced Growth 1	Reduced Growth 2	Preservation (Non-LBNL Use of Hist. Res.)	Off-Site
Aesthetics						
VIS-1: Construction of the proposed LRDP buildings would create temporary aesthetic nuisances for adjacent land uses.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
VIS-2: The proposed project could alter views of the LBNL site, and could result in a substantial adverse effect to a scenic vista or substantially damage scenic resources.	SU	LTS⇩	SU⇩	SU⇔	SU⇔	SU⇩
VIS-3: The proposed project would alter the existing visual character of the Lab site and could substantially degrade the existing visual character and quality of the site and its surroundings.	SU	LTS⇩	SU⇩	SU⇔	SU⇔	SU⇩
VIS-4: Implementation of the LRDP would introduce new sources of light and glare into the LBNL site and increase the overall level of ambient light in the site vicinity.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
VIS-5: : Implementation of the LRDP, in conjunction with cumulative development, would alter the visual character of, and change views of, the Oakland-Berkeley hills in the vicinity of Berkeley Lab.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
Air Quality						
AQ-1: Construction of new facilities proposed under the LBNL 2006 LRDP would generate short-term emissions of fugitive dust and criteria air pollutants that would affect local air quality in the vicinity of construction sites.	LSM	LSM⇩	LSM⇩	LSM⇩	LSM⇔	LSM⇔
AQ-2: Proposed development under the LBNL 2006 LRDP would generate long-term emissions of criteria air pollutants from increases in traffic and stationary sources.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇔
AQ-3: Proposed development under the LBNL 2006 LRDP would increase carbon monoxide concentrations at busy intersections and congested roadways in the project vicinity.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
AQ-4: Implementation of the proposed 2006 LRDP would expose people to toxic air contaminants.	LSM	LSM⇩	LSM⇩	LSM⇩	LSM⇔	LSM⇩
AQ-5: The project, together with anticipated future cumulative development in Berkeley and the Bay Area in general, would contribute to regional increases in criteria air pollutants.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇔

LTS – Less than significant
LSM – Less than significant with mitigation
SU – Significant and unavoidable

⇩ Impact less substantial than that of project
⇧ Impact more substantial than that of project
⇔ Impact comparable to that of project

TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Air Quality (cont.)						
AQ-6: Even though cumulative emissions of toxic air contaminants would decrease, implementation of the LBNL 2006 LRDP, in combination with other potential contributing projects, would contribute to cumulative emissions of toxic air contaminants that result in an excess cancer risk that exceeds, and would continue to exceed, 10 in one million.	SU	SU⇩	SU⇩	SU⇩	SU⇔	SU⇔
Biological Resources						
BIO-1: Development proposed under the 2006 LRDP would result in the permanent and/or temporary removal of some existing vegetation.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
BIO-2: Development under the 2006 LRDP could result in adverse impacts to drainages and/or wetlands subject to Corps and CDFG jurisdiction, including permanent or temporary fill, and accidental discharges of fill materials or other deleterious substances during construction.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇔
BIO-3: Construction activities proposed under the 2006 LRDP could adversely affect special-status nesting birds (including raptors) such that they abandon their nests or such that their reproductive efforts fail.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
BIO-4: Removal of trees and other proposed construction activities during the breeding season could result in direct mortality of special-status bats. In addition, construction noise and human disturbance could cause maternity roost abandonment and subsequent death of young.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
BIO-5: Implementation of the 2006 LRDP could result in take or harassment of Alameda whipsnakes.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
BIO-6: Project activities allowed under the LRDP, including facilities and road construction in areas designated for use as Research and Academic, Central Commons, and Support Service zones, as well as vegetation management activities in designated Perimeter Open Space, could result in the take of special-status plant species. Construction activities, as well as vegetation management activities, have the potential to disturb or result in mortality of these species or eliminate their habitat.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩

LTS – Less than significant
LSM – Less than significant with mitigation
SU – Significant and unavoidable

⇩ Impact less substantial than that of project
⇧ Impact more substantial than that of project
⇔ Impact comparable to that of project

TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Biological Resources (cont.)						
BIO-7: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding (primarily residential) development in the Oakland-Berkeley hills, would contribute to a reduction of open space and, consequently, habitat for native plants and wildlife, including special-status species.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
Cultural Resources						
CUL-1: Implementation of the 2006 LRDP would cause a substantial adverse change in the significance of historical resources, as defined in CEQA Guidelines Section 15064.5, including historical resources that have not yet been identified.	SU	SU⇩	SU⇔	SU⇔	LTS⇩	SU⇔
CUL-2: The proposed 2006 LRDP would allow demolition of buildings and structures at LBNL that have been found to be ineligible for listing in the National Register individually or as a district.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
CUL-3: Implementation of the proposed 2006 LRDP could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇔
CUL-4: Implementation of the proposed 2006 LRDP could disturb human remains, including those interred outside of formal cemeteries.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇔
CUL-5: Implementation of the proposed 2006 LRDP would not combine with other cumulative projects to result in an adverse change to the significance of historical resources that share historic significance with resources that could be lost at Berkeley Lab.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇩	LTS⇔
Geology and Soils						
GEO-1: Future construction projects within the Alquist-Priolo Zone could expose people or structures to surface fault rupture.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
GEO-2: Implementation of the LRDP would expose people and structures to seismic hazards such as groundshaking and earthquake-induced landsliding.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
GEO-3: Implementation of the LRDP would result in construction on soils that could be subject to erosion and instability.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
GEO-4: The proposed 2006 LRDP, when combined with cumulative growth, would increase the population exposed to geologic and seismic hazards.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩

LTS – Less than significant
LSM – Less than significant with mitigation
SU – Significant and unavoidable

⇩ Impact less substantial than that of project
⇧ Impact more substantial than that of project
⇔ Impact comparable to that of project

TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Hazards and Hazardous Materials						
HAZ-1: Demolition or renovation of existing structures could expose construction workers, the public, or the environment to hazardous materials in building materials.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
HAZ-2: Future construction activities, including earth-moving activities such as excavation and grading, could expose construction workers or the environment to hazardous materials.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
HAZ-3: Operation of LBNL pursuant to the 2006 LRDP, including proposed increases in laboratory and facility space, would increase the use of hazardous materials in research, facility construction, and facility maintenance activities, consequently resulting in increased generation, storage, transportation, and disposal of hazardous wastes, including transport associated with off-site disposal of hazardous and radioactive wastes, from research and facility maintenance activities.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇔
HAZ-4: Implementation of the LRDP would involve the handling of hazardous materials and wastes within one-quarter mile of an existing school.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
HAZ-5: Implementation of the LRDP could increase exposure of people or structures to hazards that could result from regional, compounded, or terrorist-related catastrophic events.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
HAZ-6: Implementation of the LRDP would expose people or structures to wildland fire hazards.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
HAZ-7: Implementation of the LRDP would contribute to cumulative increases in exposure to hazards and hazardous materials.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
Hydrology and Water Quality						
HYDRO-1: Construction pursuant to the LRDP, including earthmoving activities such as excavation and grading, could result in soil erosion and subsequent sedimentation of stormwater runoff or an increase in stormwater pollutants associated with construction-related hazardous materials.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
HYDRO-2: Implementation of the 2006 LRDP would adversely affect stormwater quality.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
HYDRO-3: Implementation of the LRDP would increase stormwater runoff rates and volumes, potentially resulting in erosion of creek channels or downstream flooding.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩

LTS – Less than significant
LSM – Less than significant with mitigation
SU – Significant and unavoidable

⇩ Impact less substantial than that of project
⇧ Impact more substantial than that of project
⇔ Impact comparable to that of project

TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Hydrology and Water Quality (cont.)						
HYDRO-4: Implementation of the LRDP, when combined with implementation of the UC Berkeley 2020 LRDP and other cumulative development, would not result in significantly adverse hydrologic or water quality impacts.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⬄	LTS⇩
Land Use and Planning						
LU-1: Implementation of the proposed 2006 LRDP would increase building square footage and adjusted daily population (ADP) at LBNL. Because new construction would be within developed areas and would not introduce substantially new land uses, the 2006 LRDP would not physically divide an established community.	LTS	LTS⇩	LTS⬄	LTS⬄	LTS⬄	LTS⬄
LU-2: Implementation of the proposed 2006 LRDP would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect, nor would the project conflict with local land use regulations such that a significant incompatibility is created with adjacent land uses.	LTS	LTS⇩	LTS⬄	LTS⬄	LTS⬄	LTS⬄
LU-3: The proposed 2006 LRDP, when combined with cumulative growth in the project vicinity, would increase the intensity of existing land uses in the area but would not physically divide an established community, conflict with applicable land use regulations, or cause conflicts with existing uses.	LTS	LTS⇩	LTS⬄	LTS⬄	LTS⬄	LTS⬄
Noise						
NOISE-1: Development under the proposed LRDP would result in temporary noise impacts related to construction and demolition activities.	SU	LTS⇩	SU⇩	SU⬄	SU⬄	SU⇩
NOISE-2: Development under the proposed LRDP would result in temporary vibration impacts related to construction activities.	LTS	LTS⇩	LTS⇩	LTS⬄	LTS⬄	LTS⇩
NOISE-3: Project-generated vehicle traffic associated with the proposed LRDP would result in an incremental, and likely imperceptible, long-term increase in ambient noise levels.	LTS	LTS⇩	LTS⇩	LTS⬄	LTS⬄	LTS⇩
NOISE-4: Continued operation of the LBNL hill site facility would result in a long-term increase in ambient noise levels.	LSM	LSM⇩	LSM⇩	LSM⬄	LSM⬄	LSM⇩
NOISE-5: Development under the proposed LRDP would result in temporary contributions to cumulative noise impacts related to construction and demolition activities.	SU	SU⇩	SU⇩	SU⬄	SU⬄	SU⇩

LTS – Less than significant
LSM – Less than significant with mitigation
SU – Significant and unavoidable

⇩ Impact less substantial than that of project
⇧ Impact more substantial than that of project
⬄ Impact comparable to that of project

TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance ***after mitigation*** and indicate maximum impact during buildout and operation, unless otherwise specified.	Project	No Project	Reduced Growth 1	Reduced Growth 2	Preservation (Non-LBNL Use of Hist. Res.)	Off-Site
NOISE-6: Development pursuant to the 2006 LRDP, together with anticipated future development at LBNL and in the surrounding area, including the UC Berkeley 2020 LRDP, would result in a cumulative increase in noise levels.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
Population and Housing						
POP-1: The proposed LRDP would produce an increase in the number of people working at LBNL but would not induce substantial population growth in the City of Berkeley or elsewhere in the region, either directly or indirectly.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
POP-2: The proposed LRDP, in conjunction with the proposed UC Berkeley 2020 LRDP and other projects that could be developed in Berkeley, would induce population growth in the City of Berkeley and the Bay Area, but the contribution of the 2005 LRDP to this impact would not be cumulatively considerable.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
Public Services and Recreation						
PUB-1: The proposed project would result in an increase in demand for fire protection services. However, this increased demand would not result in the need for additional facilities for fire protection services.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
PUB-2: The proposed project would result in an increase in calls for police services. However, this increased demand would not result in the need for additional facilities for police protection services.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
PUB-3: Implementation of the 2006 LRDP would not result in the need for new or physically altered public school facilities.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
PUB-4: Implementation of the proposed 2006 LRDP would not adversely affect the provision of parks and recreation.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
PUB-5: Under cumulative conditions, implementation of the 2006 LRDP would contribute to an increase in demand for fire protection services and police services. However, this increased demand would not result in the need for new or physically altered facilities, the construction of which could cause significant environmental impacts.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
PUB-6: Under cumulative conditions, implementation of the proposed 2006 LRDP would not result in the need for new or physically altered public school facilities.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
PUB-7: Under cumulative conditions, implementation of the proposed 2006 LRDP would not substantially affect the provision of parks and recreation facilities.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩

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⇔ Impact comparable to that of project

TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Transportation/Traffic						
TRANS-1: Implementation of the 2006 LRDP would degrade level of service at certain local intersections.	SU	LTS⇩	SU⇩	SU⇩	SU⇔	SU⇩
TRANS-2: Implementation of the 2006 LRDP would result in minor increases in transit ridership.	LTS	LTS⇩	LTS⇩	LTS⇧	LTS⇔	LTS⇩
TRANS-3: Implementation of the 2006 LRDP would result in an increase in ridership on LBNL shuttle buses, including additional demand for bicycle service on the inbound shuttles, potentially causing overcrowding on the shuttle buses or an inability by bicyclists to use the shuttle buses with their bicycles.	LSM	LSM⇩	LSM⇩	LSM⇧	LSM⇔	LSM⇩
TRANS-4: Implementation of the 2006 LRDP would increase parking demand but would provide additional parking that would be adequate to meet this demand.	LTS	LTS⇩	LTS⇔	LTS⇧	LTS⇔	LTS⇔
TRANS-5: Implementation of the 2006 LRDP would marginally increase potential traffic conflicts with pedestrians or bicyclists.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
TRANS-6: Construction of new facilities proposed under the 2006 LBNL LRDP would temporarily and intermittently increase traffic volumes above current conditions.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
TRANS-7: Traffic associated with construction of new facilities proposed under the 2006 LBNL LRDP could contribute to the degradation of pavement on Berkeley streets.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
TRANS-8: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding development in Berkeley and nearby communities that could affect the study intersections, would contribute to a degradation of level of service at local intersections.	SU	LTS⇩	SU⇩	SU⇩	SU⇔	SU⇩
Utilities, Service Systems, and Energy						
UTILS-1: Implementation of the proposed 2006 LRDP would increase the demand for water.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
UTILS-2: Implementation of the proposed 2006 LRDP would generate additional wastewater, requiring system improvements to ensure that additional wastewater flows from the Lab are directed into unconstrained sub-basins	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
UTILS-3: Development proposed under the 2006 LRDP would generate solid waste, but would not require new facilities.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩

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⇔ Impact comparable to that of project

TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Utilities, Service Systems, and Energy (cont.)						
UTILS-4: On-site construction due to development proposed under the 2006 LDRP would generate construction waste and debris.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
UTILS-5: Development proposed under the 2006 LDRP would create additional demand for electricity and natural gas, but would not result in the construction of new or expansion of existing energy production and/or transmission facilities.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
UTILS-6: The proposed 2006 LRDP, in combination with other reasonably foreseeable development in the surrounding area, would contribute to cumulative demand for utilities, service systems, and energy.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩

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V.B. Alternatives Considered and Rejected

V.B.1 Preservation Alternative with LBNL Use of Historical Resources

Because the EIR identified significant, unavoidable impacts of the proposed 2006 LRDP on historical resources due to the proposed demolition of Buildings 51 and 51A (housing the Bevatron, and collectively known as the Building 51 complex) and the potential demolition of other potential historic buildings that might in the future become eligible for the National Register of Historic Places (Impact CUL-1), a Preservation Alternative was considered whereby LBNL would retain and continue to use Building 51 and other historical resources. Two options were considered for this alternative. In the first option, the Bevatron and other historic elements of the Building 51 complex would be preserved, as would other structures at LBNL that were determined, following analysis by a qualified professional and consideration by the State Historic Preservation Officer, to be eligible for the National Register of Historic Places or the California Register of Historical Resources. The second option would entail retention of as much of the Building 51 structure and other historical resources as practical, but would include removal from these buildings of existing equipment that the Lab has determined to no longer be practically or feasibly useful. This equipment to be removed would include, for example, the Bevatron and other unused equipment within Building 51. Under this option, new offices or laboratories would be constructed inside a given historic structure, structural and mechanical systems upgrades would be performed as needed, and hazardous materials remediation would be conducted in accordance with applicable laws and regulations.

Under this alternative, buildings at LBNL determined to be historical resources under CEQA would be renovated and reused for future Lab activities or, where such reuse is not feasible due to the specific design or configuration of a building, or where equipment to be retained could preclude such reuse, that the building would be "mothballed"[1] in accordance with National Park Service guidelines for future reuse consideration.

Other than retention and possible rehabilitation and reuse of certain historic structures, this alternative is assumed to include the same development program as the proposed 2006 LRDP; that is, an increase in LBNL adjusted daily population (ADP) from 4,375 to 5,375 and an increase in building square footage of approximately 660,000 gross square feet (gsf) on the main hill site. Therefore, other than avoiding impacts to historical resources, this alternative would have essentially the same impacts as would the proposed project (the 2006 LRDP), because growth in both ADP and building area would be the same as with the project. This would be particularly true for impacts related to the intensity of development (i.e., traffic and other transportation-related impacts, air quality and noise resulting from operations, use of hazardous materials and generation of hazardous waste, population and housing demand, and demand for public services and utilities). While preservation of certain historic buildings could result in incremental changes

1 "Mothballing" is a process of closing up a building temporarily to protect it from weather as well as to secure it from vandalism. It can be a necessary and effective means of protecting the building while planning the property's future, or raising money for a preservation, rehabilitation or restoration project (NPS, 1993).

in so-called “footprint” impacts (i.e., effects on views and other aesthetic impacts, effects on biological resources, the increase in impervious surface and resulting increase in stormwater runoff, siting of buildings relative to unstable soils and earthquake faults, and construction noise impacts on nearby sensitive receptors), the changes with this alternative would likely be imperceptible, compared to impacts of the proposed 2006 LRDP, because most buildings at the Lab are not National Register-eligible, and therefore most of the LBNL hill site would be treated in the same manner under this alternative as under the proposed 2006 LRDP.

The first option under this Preservation Alternative is infeasible because old special-purpose buildings such as the Building 51 complex cannot be reused by LBNL in a cost-effective manner once they have outlived their original usefulness. That is, unlike a standard commercial or residential building, a building constructed to house, for example, a particle accelerator, cannot be readily adapted to a completely different use in the service of a technology that did not exist when the building was built. Also, retention of the Bevatron, which occupies most of the building, would preclude efficient reuse of Building 51. Similarly, it is likely that, to the extent that buildings other than the Building 51 complex are determined to be historical resources under CEQA, their adaptive reuse may not be feasible, because of either economic or technical concerns, or both.

Furthermore, specifically with regard to Building 51, that building is seismically inadequate, it has begun to deteriorate with age, and it is increasingly taxing on maintenance resources. It has become costly to maintain and repair the mostly unused facility and, without repairs, it would eventually become a structural hazard. Therefore, retention of Building 51 (and 51A) for reuse by LBNL is infeasible. For these and other reasons, demolition of the Building 51 complex and Bevatron has already been the subject of a separate EIR. Certification of that EIR is anticipated to be considered in early 2007.

Moreover, of other buildings at the Lab, only Building 71 and Building 88 have been preliminarily identified as potentially historic, and the 2006 LRDP does not anticipate demolition of these structures. Thus, this Preservation Alternative could avoid demolition of only one definitely known historical resource (the Building 51 complex); however, since reuse of this building complex is infeasible for the reasons described above, LBNL and the DOE are pursuing demolition of the Building 51 complex.

Under the second option (retention of building shells and removal of equipment), with specific regard to Building 51, this alternative would not avoid the significant impacts to historic resources associated with the proposed project. This is because, while the structure would remain, this option would entail removal of the Bevatron equipment, which itself is a historical resource. The original building was designed as a large shed to enclose a unique piece of equipment (i.e., the Bevatron). With the removal of this integral piece of scientific equipment (the Bevatron), the building would not retain sufficient integrity to remain listed in the National Register or California Register. Substantial alterations to a historic building’s integrity would be a significant impact under CEQA. As such, impacts to historic resources would be significant and unavoidable under this variant of this alternative.

In light of the above, the Preservation Alternative with LBNL Use of Historical Resources has been rejected from further consideration.

V.B.2 No Growth Alternative

This alternative would constitute a freeze on growth in both population (ADP) and occupiable building space at Berkeley Lab. Existing activities would continue and new activities could be undertaken to the extent that they would not require an increase in either ADP or the demolition of existing structures or new construction of replacement structures. Parking would not be increased on the hill site.

Under this alternative, none of the impacts identified in Chapter IV related to the intensity of development would occur. That is, there would be no increase in traffic or demand for other transportation modes, no increase in emissions or noise resulting from operations, no change in population or housing demand, and no increased demand for public services and utilities, nor would there be any meaningful change in use of hazardous materials and generation of hazardous waste. No impacts relating to aesthetics, biological resources, geology, hydrology, or and construction-period impacts would occur as no demolition or new construction would occur under this alternative. This alternative would also avoid the proposed project’s significant and unavoidable aesthetic, noise and traffic impacts, but would not necessarily avoid effects on historical resources, as it assumed that, under this alternative, the Building 51 complex (Bevatron) would be demolished, to make room for modern, functional facilities, as under the 2006 LRDP.

This alternative was rejected from further consideration because it would advance few, if any, of the objectives of the proposed project related to the continuing advancement of science and improvement of facilities at LBNL.

V.C. No Project Alternative

V.C.1 Description

The No Project Alternative would result in development at the main LBNL site pursuant to the existing 1987 LRDP. The proposed 2006 LRDP would not be implemented. Under the No Project Alternative, the amount of occupiable building space would increase up to approximately 2 million gsf, or roughly 13 percent above existing conditions, and the ADP would increase by about nine percent from existing conditions, to 4,750.[2] No increases in the parking supply would occur. Since the main hill site is generally built out pursuant to the 1987 LRDP, with the exception of a few projects that have been approved but are not yet constructed, future development at the hill site would require demolition of existing space. Such redevelopment on the hill site would be subject to project-specific environmental review, most likely tiered from the 1987 LRDP EIR, as amended. Additionally, any future development would be subject to the

2 Total occupiable building space of approximately 2 million gsf used here for purposes of comparison; actual total permitted under the 1987 LRDP is 1,996,200 gsf, as indicated in Chapter III, Project Description.

goals, objectives and mitigation measures identified within the 1987 LRDP and 1987 LRDP EIR, as amended.

Projects that have been approved pursuant to the 1987 LRDP, but not yet constructed, that would likely be developed and constructed under the No Project Alternative with continued implementation of the 1987 LRDP include the 25,000-square-foot Guest House, the approximately 30,000-square-foot User Support Building, and the 7,100-square-foot Animal Care Facility, identified within the Illustrative Development Scenario as Buildings S-5, S-6, and S-15, respectively. The Computational Research & Theory (CRT) Building (Building S-1 under the Illustrative Development Scenario), could also be constructed under the No Project Alternative, at a later date, following removal of Building 51 and the Bevatron. The CRT Building would require project-specific environmental review prior to construction. Additionally, under the No Project Alternative, some of the roadway and parking improvements (but not an increase in parking spaces) and utility upgrades outlined in Chapter III, Project Description, would be constructed. This would be approved pursuant to the 1987 LRDP, subject to further environmental review if needed.

To accommodate future growth under the No Project Alternative, an increase in off-site leased space could occur. The Lab would not construct off-site space, but rather would lease and occupy either already-built facilities or new facilities that would have been constructed by others and approved by some other entity (e.g., a city or county) and would be subject to that entity's CEQA review. Off-site facilities would, in general, provide office or research and development space. Space for specialty research needs, including most of those involving hazardous materials or specialized facilities such as particle accelerators, would continue to be provided at the main hill site. While such off-site facilities have not been identified, it would be reasonable to assume that leased off-site space would be in proximity to the hill site and other existing leased space (e.g., Berkeley, Oakland, Walnut Creek). However, it is not possible to know with certainty where such facilities would be located or how large they might be.

V.C.2 Impacts

As compared with the proposed project, the No Project Alternative would result in fewer impacts, and the intensity of the impacts described in Chapter IV of this EIR would be substantially less than with the proposed project. The No Project Alternative could reduce the significant and unavoidable impact associated with the potential for implementation of the 2006 LRDP to cause a substantial adverse change in the significance of historical resources that have not yet been identified. The No Project Alternative would avoid the project's significant and unavoidable aesthetic, noise and traffic impacts.

The demolition of the Bevatron has been evaluated in a separate project-specific EIR. The demolition of the Bevatron is identified in that document as resulting in a significant and unavoidable impact to cultural resources. This impact would remain under the No Project Alternative, as it would not be a direct result of the 2006 LRDP and would occur regardless of whether the 2006 LRDP were adopted. Future building replacement at the hill site, while anticipated under the No Project Alternative, is not analyzed herein at a building-specific or location-specific level, because it would be speculative to attempt to determine the nature and degree of potential impacts at this time. Additionally, future development at the hill site would undergo project-specific environmental review and would be subject to the existing 1987 LRDP.

The No Project Alternative would advance few, if any, of the objectives of the proposed project related to the continuing advancement of science and improvement of facilities at LBNL.

V.C.2.1 Aesthetics

The proposed project would result in significant, unavoidable aesthetic impacts. Under the No Project Alternative, it is assumed that the existing appearance of the hill site would generally remain unchanged, with the exception of the development of approved projects identified above. Because most of these buildings would be relatively unobtrusive in views from off-site, this alternative would have substantially lesser aesthetic impacts than those identified for the proposed project, and the aesthetic impacts of this alternative would be less than significant.

V.C.2.2 Air Quality

The proposed project would result in less-than-significant project-specific air quality impacts, with mitigation. Under the No Project Alternative, new development would not occur, with the exception of the development of approved projects identified above. Thus, this alternative would result in substantially lesser emissions of criteria air pollutants and toxic air contaminants than would the proposed project, and these impacts would be less than significant. However, while the No Project Alternative would result in a lesser contribution than would the project to the cumulative significant impact with regard to toxic air contaminant emissions, this contribution would still be considerable, and the cumulative impact would remain significant and unavoidable.

V.C.2.3 Biological Resources

With mitigation, the proposed project would result in less-than-significant impacts on biological resources. The No Project Alternative does not identify future development at the hill site, with the exception of the projects identified above. Therefore, this alternative would result in lesser impacts on biological resources than would the proposed project.

V.C.2.4 Cultural Resources

The proposed project would result in significant and unavoidable impacts to historical resources, primarily due to demolition of the Building 51 complex and the Bevatron (and, potentially, other resources determined to be historical). As this demolition would occur regardless of whether the 2006 LRDP were adopted and implemented, it is assumed to occur as part of the No Project Alternative, as well, and thus this impact would remain significant and unavoidable. The demolition of the Bevatron has been evaluated in a separate project-specific EIR; certification of that EIR is anticipated to be considered in early 2007. The demolition of the Bevatron is identified in that document as resulting in a significant and unavoidable impact on cultural resources. The No Project Alternative, however, would reduce the likelihood, compared to the proposed project, that other buildings, as yet unrecognized as historical resources under CEQA, might be demolished. Thus, this alternative would result in lesser impacts overall to historic resources than would the 2006 LRDP, but the impact would continue to remain significant and unavoidable based on the demolition of the Building 51 complex and the Bevatron. Effects on archaeological resources would be less than significant with mitigation, as under the proposed project.

V.C.2.5 Geology and Soils

With mitigation, the proposed project would result in less-than-significant impacts with respect to geology and soils. Under the No Project Alternative, new development would not occur at the hill site, with the exception of the development of approved projects identified above. Therefore, this alternative would result in geology impacts that would be less substantial than the potential impacts identified under the proposed 2006 LRDP, and the impacts of this alternative would be less than significant with mitigation.

V.C.2.6 Hazards and Hazardous Materials

With mitigation, the proposed project would result in less-than-significant impacts with respect to hazards and hazardous materials. Under the No Project Alternative, new development would not occur at the hill site, with the exception of the development of approved projects identified above. Therefore, this alternative would result in hazards and hazardous materials impacts that would be less substantial than those of the proposed project, and the impacts of this alternative would be less than significant with mitigation.

V.C.2.7 Hydrology and Water Quality

The proposed project would result in less-than-significant impacts to hydrology and water quality. Under the No Project Alternative, no new development at the hill site would occur, with the exception of the development of approved projects identified above. Thus, this alternative would result in lesser hydrology and water quality impacts than the less-than-significant impacts identified under the proposed project, and the impacts of this alternative would be less than significant.

V.C.2.8 Land Use and Planning

The proposed project would result in less-than-significant land use impacts. Under the No Project Alternative, no new land uses would be introduced to the site and land use impacts would be lesser than the less-than-significant impacts of the proposed project. Land use impacts would be less than significant under the No Project Alternative.

V.C.2.9 Noise

With mitigation, the proposed project operations would result in less-than-significant noise impacts, but project construction activities would result in a significant and unavoidable noise impact. The effects of the No Project Alternative with respect to noise from construction and demolition activity and traffic noise would be less substantial than the noise impacts of the proposed project, since substantially less demolition and construction activity would occur. Future redevelopment on the hill site would be subject to project-specific environmental review, most likely tiered from the 1987 LRDP EIR, as amended. Any future development would be subject to the goals, objectives and mitigation measures identified within the 1987 LRDP and 1987 LRDP EIR, as amended. Moreover, it is anticipated that the development under this alternative would be in locations relatively distant from existing neighborhoods. Thus, it is likely that the noise effects of this alternative would be less than significant.

V.C.2.10 Population and Housing

The proposed project would result in less-than-significant impacts with respect to population and housing. The No Project Alternative would minimally increase the ADP at the hill site, compared to existing conditions, and would result in correspondingly smaller changes in employment and housing demand, compared to those identified for the 2006 LRDP. Thus, effects of the No Project Alternative would be less substantial than the less-than-significant impacts of the proposed project, and the effects of the No Project Alternative would likewise be less than significant.

V.C.2.11 Public Services and Recreation

The proposed project would result in less-than-significant impacts with respect to public services and facilities. Under this alternative, no substantial change in the ADP at the hill site would occur; therefore, the demand for public services would not increase substantially and would be less than the anticipated demand under the proposed project. The effect on public services and facilities would be smaller than that of the proposed project and, like project impacts, the effects of this alternative on police, fire, schools, and parks would be less than significant.

V.C.2.12 Transportation/Traffic

The No Project Alternative would not include the increases in on-site parking that are part of the proposed project. As a result the significant and unavoidable traffic impacts (both project-specific and cumulative) that would result from the project at the intersections of Gayley Road/Stadium Rim Way, Durant Avenue/Piedmont Avenue, and Hearst/Gayley/La Loma would be avoided under this alternative. Other traffic impacts would also be less substantial than those of the proposed project. While future building replacement at the Lab could result in relatively minor traffic impacts during construction, no significant transportation impacts related to construction and demolition activity are anticipated, given the less-than-significant construction impacts of the proposed project. Therefore, transportation impacts of the No Project Alternative would be less substantial than those of the proposed project, and would be less than significant, with mitigation.

V.C.2.13 Utilities, Service Systems, and Energy

With mitigation, the proposed project would result in less-than-significant impacts with respect to utilities, service systems and energy. Under the No Project Alternative, the demand for utilities (e.g., water and electricity use, wastewater generation, solid waste generation), service systems, and energy would be incrementally higher than existing conditions, as development on the site under the existing LRDP allows for minimal increases in the ADP and occupiable building space. Solid waste generation from construction and demolition activity would be less than the project's less-than-significant effects because substantially fewer on-site development projects would be proposed. Thus, effects would be less substantial than those of the proposed project.

V.D. Reduced Growth 1 Alternative

V.D.1 Description

The Reduced Growth 1 Alternative would consist of development at the main hill site at a lower intensity than what is proposed under the 2006 LRDP. At the 2025 planning horizon for the Reduced Growth 1 Alternative, which would be the same horizon as for the 2006 LRDP, this alternative could result in an ADP of up to about 5,135, up to 2,176,200 square feet of occupiable building space at the main hill site and approximately 2,675 parking spaces at the hill site (see Table V-1). Because this alternative would reduce the significant and unavoidable impacts associated with the project more than would any other alternative other than the No Project Alternative, this alternative would be considered the environmentally superior alternative.

Compared to the proposed 2006 LRDP (including the reduction and the scope of the proposed LRDP in response to comments from the City of Berkeley), this alternative would represent about 63 percent of the net new occupiable building space, about 76 percent of the new ADP, and 75 percent of the net new parking spaces proposed under the 2006 LRDP. Under the Reduced Growth 1 Alternative, future demand for any additional building space would be accommodated at off-site locations. As under the No Project Alternative, it is anticipated that the Lab would lease and occupy either already-built facilities or new facilities that would have been approved by some other entity and subject to that entity's CEQA review. Additionally, off-site leased space would, in general, likely be located in proximity to existing space occupied by LBNL (e.g., Berkeley, Oakland, Walnut Creek). However, it is not possible to know with certainty where such facilities would be located or how large they might be.

While this alternative would be more likely to meet key project objectives than would the No Project Alternative, it would not fully meet the Lab's objectives. Specifically, by allowing for less growth in space and population on the hill site, this alternative would be less conducive to the advancement of LBNL's scientific mission, and it could limit the Lab's ability to develop research facilities and infrastructure to meet anticipated future growth in research. Additionally, this alternative would not foster collaborative work environments among researchers, since it could result in a split of resources between locations as greater use of some off-site locations could be necessary to accommodate the Lab's future growth.

V.D.2 Impacts

V.D.2.1 Aesthetics

The Reduced Growth 1 Alternative would result in a smaller amount of development on the hill site than the proposed project. Thus, the number of new structures would be less than under the proposed project, as would the potential for changes in the visual environment. Similar to the proposed project, development under this alternative would be subject to the guidance within the 2006 LRDP as well as the mitigation measure related to potential light and glare impacts. This alternative would reduce the overall building square footage, as well as possibly some specific building height and mass, thereby reducing the potential for visual changes to the LBNL site. Figures V-1 through V-3 illustrate potential height and massing that could be developed under the Reduced Growth 1 Alternative from representative public vantage points. The comparison of these representative buildings to those included in Section IV.A, Aesthetics and Visual Quality, illustrates lower building heights and thus, less intrusion of new buildings into the unbuilt areas on the LBNL site (see Figures V-1a and V-2a compared to Figures V-1b and V-2b; the latter are reprinted from Section IV.A). Visual changes under this alternative would be lessened when compared to the project. As stated in Section IV.A, implementation of the proposed 2006 LRDP would alter views of the LBNL site from nearby areas, including the Lawrence Hall of Science and residential neighborhoods and commercial areas in the cities of Berkeley and Oakland. In general, views of the Lab hill site would be incrementally intensified because additional buildings would be visible, although no buildings would be constructed of a height and/or without sufficient screening such that they would dramatically stand out from existing Lab development in long-range views of the hillside. While some observers would not consider the changes in the existing visual setting to be substantial, visual quality is subjective, and different observers may have different reactions to changes in long-range views of the Lab's hill site, with some people likely to find the increase in building density, even though partially screened, to be disruptive or even offensive. Therefore, for purposes of a conservative analysis, this EIR concludes that the proposed LRDP, as described by the Illustrative Development Scenario shown in the visual simulations, would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially damage scenic resources. While the lesser building heights under Reduced Growth 1 Alternative would further reduce visibility of development from off-site locations, compared to conditions with the project, some changes would remain readily apparent and could be considered disruptive. Therefore, visual impacts, while less substantial than under the project, would remain significant and unavoidable with implementation of this alternative. As with the project, light and glare impacts would be less than significant with mitigation and construction-period and cumulative impacts would be less than significant.

V.D.2.2 Air Quality

The Reduced Growth 1 Alternative would result in impacts similar to, but reduced in magnitude from, those of the proposed project. Mitigation measures adopted as part of the proposed project to reduce potentially significant air quality construction impacts to less–than-significant levels would also apply under this alternative. The Reduced Growth 1 Alternative would result in less development on the hill site and result in a decrease in operational emissions of criteria pollutants

Existing view from University Avenue at San Pablo Avenue

Conceptual visual simulation of Reduced Growth Alternative

View Diagram of Reduced Growth Alternative

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-1a
Alternative Site Photo and Simulation

Existing view from University Avenue at San Pablo Avenue

Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-1b
Site Photo and Simulation

Existing view from Centenial Drive crosswalk at Botanical Garden

Conceptual visual simulation of Reduced Growth Alternative

View Diagram of Reduced Growth Alternative

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-2a

Alternative Site Photo and Simulation

Existing view from Centenial Drive crosswalk at Botanical Garden

Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

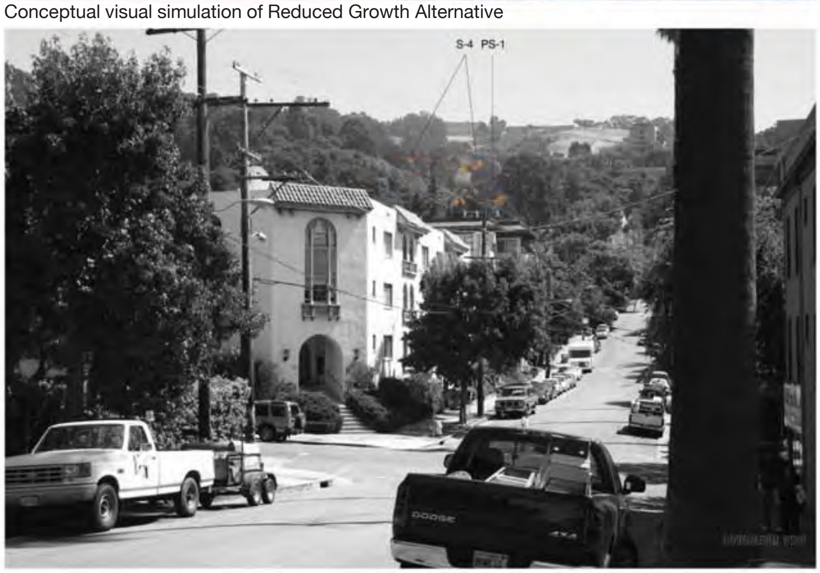
SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-2b
Site Photo and Simulation

Existing view from Ridge Road at Euclid Avenue

Conceptual visual simulation of Reduced Growth Alternative



View Diagram of Reduced Growth Alternative

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-3a
Alternative Site Photo and Simulation


Existing view from Ridge Road at Euclid Avenue


Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-3b
Site Photo and Simulation

and toxic air contaminants compared to the proposed project. Therefore, this alternative would result in proportionately smaller operational air quality impacts than the less-than-significant effects of the proposed project, and effects of this alternative would also be less than significant. As with the project, the Reduced Growth 1 Alternative would result in a cumulative significant impact with regard to toxic air contaminant emissions, although the contribution of this alternative would somewhat less than that of the project.

V.D.2.3 Biological Resources

The potential biological resources impacts under the Reduced Growth 1 Alternative would be similar to those described for the proposed project. However, since this alternative would result in less development on the hill site, the potential for construction and demolition activities to adversely affect on-site biological resources would be lower. Mitigation measures applicable to the proposed project would apply to this alternative, and, as with the proposed project, would reduce impacts of this alternative to less-than-significant levels.

V.D.2.4 Cultural Resources

The Reduced Growth 1 Alternative would result in cultural resources impacts similar to those of the proposed project. The significant and unavoidable impact under the proposed project related to demolition and construction activities that could affect as-yet unidentified historical resources would remain under this alternative. The significant and unavoidable impact associated with the demolition of the Bevatron, and addressed in a separate project-specific EIR, would also remain under this alternative. Under this alternative, impacts to archaeological resources and the potential to disturb human remains would be reduced to less-than-significant levels with mitigation measures identified for the proposed project and would be less substantial than those of the project, since this alternative would result in less new development at the hill site.

V.D.2.5 Geology and Soils

Geology and soils impacts under the Reduced Growth 1 Alternative would generally be the same as described for the proposed project. However, since this alternative would result in less development on the hill site, and therefore a lower ADP, the exposure to geologic and seismic hazards would be somewhat reduced. Mitigation measures applicable to the proposed project would apply to this alternative, and the impacts of the Reduced Growth 1 Alternative would be somewhat less substantial than impacts of the proposed project. Impacts of this alternative would be less than significant with mitigation.

V.D.2.6 Hazards and Hazardous Materials

The potential hazards and hazardous materials impacts under the Reduced Growth 1 Alternative would generally be the same as described for the proposed project. However, since this alternative would result in less development on the hill site, impacts associated with hazards and hazardous materials would be incrementally less. Mitigation measures applicable to the proposed project would apply to this alternative. Impacts of this alternative would be less than significant with mitigation.

V.D.2.7 Hydrology and Water Quality

The potential hydrology and water quality impacts under the Reduced Growth 1 Alternative would generally be the same as those described for the proposed project. However, since this alternative would result in less development on the hill site, hydrologic and water quality impacts would be incrementally less than the less-than-significant impacts of the proposed project. Impacts of this alternative would be less than significant.

V.D.2.8 Land Use and Planning

The Reduced Growth 1 Alternative land use impacts, in general, would be the same as described for the proposed project since this alternative would result in a similar mix of land use on the hill site. As with the proposed project, land use impacts would be less than significant.

V.D.2.9 Noise

The Reduced Growth 1 Alternative would result in construction noise impacts similar to those of the proposed project, but less in overall duration due to the lesser amount of construction that would occur under this alternative. Mitigation measures adopted as part of the proposed project would also apply to this alternative. As with the proposed project, individual construction and/or demolition projects undertaken under the Reduced Growth 1 Alternative could result in noise impacts that could not be fully mitigated. The Reduced Growth 1 Alternative would result in less development on the hill site compared to the proposed project, and thus a proportionately smaller increase in the ambient noise level due to operational noise. Significant and unavoidable impacts associated with construction noise would be proportionately lower since less development would occur, but would be significant and unavoidable under this alternative.

V.D.2.10 Population and Housing

The Reduced Growth 1 Alternative would result in less development on the hill site and roughly three-quarters of the new ADP of the proposed project. Thus, impacts attributable to increased population and housing demand would be smaller than the less-than-significant impacts of the proposed project, and would also be less than significant.

V.D.2.11 Public Services and Recreation

The new ADP on the hill site under the Reduced Growth 1 Alternative would be roughly three-quarters of the new ADP under the proposed project. Thus, the demand for fire services, police services, schools, and parks and recreation would be proportionately lower. Impacts to public services under this alternative would be lesser than the less-than-significant impacts of the proposed project, and would likewise be less than significant.

V.D.2.12 Transportation/Traffic

The Reduced Growth 1 Alternative would result in less development and 75 percent of the net new parking spaces on the hill site compared to the proposed LRDP project. Under this alternative, the ADP would increase by about 760, or about 76 percent of the new ADP proposed under the 2006 LRDP. Since this alternative would provide fewer on-site parking spaces, compared to the proposed project, it would result in correspondingly lower traffic volumes; the alternative would therefore have a less-than-significant impact on the intersection of Hearst Avenue at Gayley Road/La Loma Avenue, rather than the significant and unavoidable impact that the 2006 LRDP project would have. That change in impact determination is because, while the level of service (LOS) would be unchanged, the increase in traffic volume due to this alternative would be less than the five-percent threshold of significance for intersections already operating at LOS E or LOS F when no change in LOS occurs with the addition of project traffic. (See Section IV.L, Transportation/Traffic, for a further discussion of this five-percent threshold.) As with the proposed project, the installation of traffic signals at two other intersections (Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue) would be necessary to mitigate the alternative's significant impacts, and mitigation measures identified for the project (installation of traffic signals) would be required to reduce these impacts to less-than-significant levels. Also as with the project, because LBNL could not implement these measures on its own, the impact at these intersections would be considered significant and unavoidable. Compared to the proposed project, this alternative would result in incrementally lesser transit impacts, while pedestrian, bicycle, and parking impacts would be similar; these impacts would all be less than significant. As already noted, because LBNL could not implement intersection operation mitigations, the impact at the two intersections noted above would be considered significant and unavoidable.

V.D.2.13 Utilities, Service Systems, and Energy

The proposed occupiable building space and ADP on the hill site under the Reduced Growth 1 Alternative would be lower than under the proposed project. Thus, the demand for water, electricity, natural gas and the generation of wastewater, stormwater, and solid waste associated with the increased development intensity would be proportionately lower on the hill site. Mitigation measures applicable to the proposed project to reduce potential impacts to less-than-significant levels would also apply to this alternative. Impacts to utilities, service systems and energy under this alternative would generally be less substantial than the impacts of the proposed project.

V.E. Reduced Growth 2 Alternative

V.E.1 Description

The Reduced Growth 2 Alternative proposes a development intensity at the main hill site that is lower (both in terms of ADP and occupiable building space) than the intensity of development that was initially proposed in the 2006 LRDP when the Notice of Preparation was issued. The Reduced Growth 2 Alternative proposes a development intensity at the main hill site that is greater, however, than the ADP and occupiable building space proposed under Reduced Growth 1 Alternative. The Reduced Growth 2 Alternative would provide somewhat less net new occupiable building space than that currently proposed pursuant to the 2006 LRDP including the reduction in the scope of the LRDP that was made in response to comments from the City of Berkeley, but incrementally more ADP (see Table V-1). At the 2025 planning horizon, the Reduced Growth 2 Alternative could result in an ADP up to about 5,400, up to 2,350,000 square feet of occupiable building space at the main hill site, and approximately 2,675 parking spaces at the hill site.

Compared to the 2006 LRDP as currently proposed, including the reduction in scope pursuant to the comments from the City of Berkeley, this alternative represents 102.5 percent of the new ADP, about 89 percent of the net new occupiable building space, and 75 percent of the net new parking spaces. When compared to the LRDP as initially proposed when the Notice of Preparation was issued, this alternative represents roughly 90 percent of the new ADP, about three-quarters of the net new occupiable building space, and 62.5 percent of the net new parking spaces.

Additional demand for building space beyond that provided under this alternative would be expected to be relatively low since much of the growth proposed under the LRDP would be accommodated under this alternative. Should demand for additional off-site space be necessary, it would be leased at off-site locations. Off-site locations would include either already-built facilities or new facilities approved by some other entity and subject to that entity's CEQA review. In general, it would be expected that off-site leased space would be located in proximity to existing occupied spaces (e.g., Berkeley, Oakland, Walnut Creek). However, it is not possible to know with certainty where such facilities would be located or how large they might be.

V.E.2 Impacts

V.E.2.1 Aesthetics

The Reduced Growth 2 Alternative prescribes less net new occupiable building space on the hill site compared to the 2006 LRDP, and therefore would result in fewer visual changes. Similar to the proposed project, development under this alternative would be subject to the mitigation measure related to potential light and glare impacts. This alternative would reduce the overall building square footage, as well as specific building height and mass, although it would not reduce the overall building square footage by as much as the Reduced Growth 1 Alternative, and it would result in a slightly increased ADP. As stated in Section IV.A, implementation of the proposed 2006 LRDP would alter views of the LBNL site from nearby areas, including the Lawrence Hall of Science and residential neighborhoods and commercial areas in the cities of Berkeley and Oakland. In general, views of the Lab hill site would be incrementally intensified because additional buildings would be visible, although no buildings would be constructed of a height and/or without sufficient screening such that they would dramatically stand out from existing Lab development in long-range views of the hillside. While some observers would not consider the changes in the existing visual setting to be substantial, visual quality is subjective, and different observers may have different reactions to changes in long-range views of the Lab's hill site, with some people likely to find the increase in building density, even though partially screened, to be disruptive or even offensive. Therefore, for purposes of a conservative analysis, this EIR concludes that the proposed LRDP, as described by the Illustrative Development Scenario shown in the visual simulations, would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially damage scenic resources. Because the Reduced Growth 2 Alternative would be comparable in intensity of development to the project, visual impacts would also be comparable, and would be significant and unavoidable with implementation of this alternative, as with the project. Also as with the project, light and glare impacts would be less than significant with mitigation and construction-period and cumulative impacts would be less than significant.

V.E.2.2 Air Quality

The Reduced Growth 2 Alternative proposes less occupiable building space on the hill site and fewer parking places (and thus auto traffic to and from the hill site) than the 2006 LRDP as currently proposed, and would result in proportionately lesser potential air quality impacts. Mitigation measures to address air quality construction impacts under the proposed project would apply under this alternative, and implementation of such measures would reduce potential impacts to less-than-significant levels. Operational emissions of criteria pollutants and toxic air contaminants would also be reduced under this alternative due to less development and fewer vehicles at the hill site. Therefore, this alternative would result in proportionately smaller operational air quality impacts than the less-than-significant effects of the proposed project, and effects of this alternative would also be less than significant. As with the project, the Reduced Growth 2 Alternative would result in a cumulative significant impact with regard to toxic air contaminant emissions, although the contribution of this alternative would somewhat less than that of the project.

V.E.2.3 Biological Resources

Biological resources impacts under the Reduced Growth 2 Alternative would be similar to those described for the proposed project, since this alternative would result in a comparable level of development on the hill site. Mitigation measures applicable to the proposed project would also apply to the Reduced Growth 2 Alternative.

V.E.2.4 Cultural Resources

The Reduced Growth 2 Alternative would result in cultural resources impacts similar to those of the proposed project. Significant and unavoidable impacts under the proposed project related to demolition and construction activities that could affect as-yet unidentified historical resources, and the demolition of the Bevatron (addressed in a separate project-specific EIR), would remain under this alternative. Mitigation measures applicable to the proposed project to reduce potential impacts to archaeological resources and the potential to disturb human remains would also apply to this alternative. Archaeological impacts of this alternative would also be similar to those of the project, given the comparable level of ground-disturbing activities anticipated.

V.E.2.5 Geology and Soils

Geology and soils impacts under the Reduced Growth 2 Alternative would generally be the same as described for the proposed project, since the amount of net new occupiable building space under this alternative would be only slightly lower than under the LRDP and the new ADP would be slightly higher. Mitigation measures applicable to the proposed project would also apply to this alternative, and the impacts of the Reduced Growth 2 Alternative would be less than significant with mitigation.

V.E.2.6 Hazards and Hazardous Materials

The Reduced Growth 2 Alternative would result in slightly less net new occupiable building space and slightly more new ADP on the hill site compared to the proposed project. Thus, impacts associated with hazards and hazardous materials would be generally about the same as those of the project. Mitigation measures applicable to the proposed project would also apply to this alternative, and would reduce impacts to less-than-significant levels.

V.E.2.7 Hydrology and Water Quality

The potential hydrology and water quality impacts under the Reduced Growth 2 Alternative, in general, would be the same as those described for the proposed project. However, because this alternative proposes slightly less development on the hill site, hydrologic and water quality impacts would be incrementally less. The impacts of the Reduced Growth 2 Alternative would be incrementally less than the less-than-significant impacts of the proposed project.

V.E.2.8 Land Use and Planning

The Reduced Growth 2 Alternative proposes a similar mix of land uses as under the LRDP, though with slightly less net new occupiable building space and slightly higher ADP. Therefore, land use impacts would generally be the same as described for the proposed project, and, as with the proposed project, land use impacts would be less than significant.

V.E.2.9 Noise

Although the Reduced Growth 2 Alternative proposes slightly less net new occupiable building space at the hill site compared to the proposed project, noise impacts during construction under this alternative would be similar to those of the project, as would the increase in ambient noise level following construction completion, since the difference in development proposed is relatively small. Mitigation measures adopted as part of the proposed project would also apply to this alternative and the incorporation of such measures would reduce potentially significant noise impacts to less-than-significant levels. However, as with the proposed project, individual construction and/or demolition projects undertaken under the Reduced Growth 2 Alternative could result in noise impacts that could not be fully mitigated, and therefore construction noise impacts would be significant and unavoidable under this alternative.

V.E.2.10 Population and Housing

The Reduced Growth 2 Alternative would result in less occupiable building space on the hill site and about 2.5 percent more growth in the ADP than proposed under the LRDP (although 11 percent less ADP growth than proposed in the original LRDP identified in the Notice of Preparation). Because the ADP at the planning horizon would be only slightly higher than that now proposed under the LRDP, impacts attributable to increases in population and housing demand would likely be comparable to the proposed project under this alternative, and would also be less than significant.

V.E.2.11 Public Services and Recreation

The Reduced Growth 2 Alternative would result in slightly higher ADP than proposed under the LRDP. Thus, the demand for fire services, police services, schools, and parks and recreation would also be slightly higher. Impacts to public services under this alternative would be similar to the less-than-significant impacts of the proposed project, and would likewise be less than significant.

V.E.2.12 Transportation/Traffic

The Reduced Growth 2 Alternative would result in 75 percent of the number of parking spaces on the hill site compared to development under the proposed 2006 LRDP. Under this alternative, the ADP would increase by about 1,025 or about 102.5 percent of the ADP increase proposed under the 2006 LRDP. Under this alternative, the use of transit and LBNL shuttles would increase to a higher level than with the proposed project. However, since this alternative would provide fewer on-site parking spaces, compared to the proposed project, it would result in correspondingly lower traffic volumes; the alternative would therefore have a less-than-significant impact on the intersection of Hearst Avenue and Gayley Road/La Loma Avenue, rather than the significant and unavoidable impact that the 2006 LRDP project would have. That change in impact determination is because, while the LOS would be unchanged, the increase in traffic volume due to this alternative would be less than the five-percent threshold of significance for intersections already operating at LOS E or LOS F when no change in LOS occurs with the addition of project traffic. Project mitigation measures to address significant impacts to transit service would also apply to this alternative, and the implementation of such measures would reduce significant impacts to less-than-significant levels. Similar to the proposed project, the installation of traffic signals at two intersections (Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue) would be necessary to mitigate significant impacts and because LBNL could not implement these measures on its own, the impact at these intersections would be considered significant and unavoidable. Compared to the proposed project, this alternative would result in proportionately greater transit impacts, since less parking would be provided on-site, although these impacts would be less than significant with project mitigation measures. Because LBNL could not implement intersection operation mitigations, the impact at the two intersections noted above would be considered significant and unavoidable.

V.E.2.13 Utilities, Service Systems, and Energy

The Reduced Growth 2 Alternative, at the planning horizon, would result in slightly more ADP but less occupiable building space compared to the 2006 LRDP. The demand for utilities, service systems, and energy is generally related to on-site population and building space; therefore, under this alternative the potential impacts to utilities, service systems, and energy would be expected to be greater than under the Reduced Growth 1 Alternative, and slightly lower than the impacts of the proposed project. Mitigation measures applicable to the proposed project to reduce potential impacts to less-than-significant levels would apply to this alternative.

V.F. Preservation Alternative with Non-LBNL Use of Historical Resources

V.F.1 Description

Under the Non-LBNL Use Preservation Alternative, a limited number of key historical resources, when determined to be no longer of feasible use to Berkeley Lab, would be dedicated to non-LBNL uses and could be managed by another public agency, such as the National Park Service. This alternative was originally drafted for the EIR on the proposed demolition of Building 51 and the Bevatron (LBNL, 2005), with the intention of actively preserving Building 51 and the Bevatron equipment within it. It is assumed that this alternative could possibly be extended to a limited number of other key historical resources, should such resources be identified and be proposed for demolition by the Lab. (To date, no other such resources have been proposed for demolition.) Under this alternative, another agency would maintain and preserve the historical resource(s) in accordance with the *Secretary of the Interior's Standards for Preservation*, and would allow limited public access for interpretive/educational purposes.[3]

While this alternative could reduce or eliminate significant impacts to historical resources, it could substantially complicate implementation of the proposed LRDP, particularly if multiple historical resources were to be involved over time. Moreover, the Lab's existence as a secure facility would largely limit public access to such resources.

V.F.2 Impacts

Other than retention and possible rehabilitation and reuse of certain historic structures, this alternative is assumed to include the same development program as the proposed 2006 LRDP; that is, an increase in LBNL Adjusted Daily Population (ADP) from 4,375 to 5,375 and an increase in building square footage of approximately 660,000 gross square feet (gsf) on the main hill site. Therefore, other than avoiding impacts to historical resources, this alternative would have essentially the same impacts as would the proposed project (the 2006 LRDP), because growth in both ADP and building area would be the same as with the project. This would be particularly true for impacts related to the intensity of development (i.e., traffic and other transportation-related impacts, air quality and noise resulting from operations, use of hazardous materials and generation of hazardous waste, population and housing demand, and demand for public services and utilities). While preservation of certain historic buildings could result in

3 The Standards for Preservation define Preservation as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property." The focus is on "ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction," and exterior additions are generally not undertaken.

incremental changes in so-called “footprint” impacts (i.e., effects on views and other aesthetic impacts, effects on biological resources, the increase in impervious surface and resulting increase in stormwater runoff, siting of buildings relative to unstable soils and earthquake faults, and construction noise impacts on nearby sensitive receptors), the changes with this alternative would likely be imperceptible, compared to impacts of the proposed 2006 LRDP, because most buildings at the Lab are not National Register-eligible, and therefore most of the LBNL hill site would be treated in the same manner under this alternative as under the proposed 2006 LRDP.

V.F.2.1 Aesthetics

As stated in Section IV.A, implementation of the proposed 2006 LRDP would alter views of the LBNL site from nearby areas, including the Lawrence Hall of Science and residential neighborhoods and commercial areas in the cities of Berkeley and Oakland. In general, views of the Lab hill site would be incrementally intensified because additional buildings would be visible, although no buildings would be constructed of a height and/or without sufficient screening such that they would dramatically stand out from existing Lab development in long-range views of the hillside. While some observers would not consider the changes in the existing visual setting to be substantial, visual quality is subjective, and different observers may have different reactions to changes in long-range views of the Lab’s hill site, with some people likely to find the increase in building density, even though partially screened, to be disruptive or even offensive. Therefore, for purposes of a conservative analysis, this EIR concludes that the proposed LRDP, as described by the Illustrative Development Scenario shown in the visual simulations, would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially damage scenic resources. Although this alternative could result in incrementally diminished aesthetic effects at the sites of specific historical resources, overall visual impacts would be comparable to those of the project, and would be significant and unavoidable with implementation of this alternative, as with the project. Also as with the project, light and glare impacts would be less than significant with mitigation and construction-period and cumulative impacts would be less than significant.

V.F.2.2 Air Quality

The Non-LBNL Use Preservation Alternative would result in impacts similar to those of the proposed project. Mitigation measures adopted as part of the proposed project to reduce potentially significant air quality construction impacts to less-than-significant levels would also apply under this alternative. Operational emissions would be less than significant, as with the proposed project. Also as with the project, this alternative would result in a cumulative significant impact with regard to toxic air contaminant emissions.

V.F.2.3 Biological Resources

The potential biological resources impacts under the Non-LBNL Use Preservation Alternative would be essentially the same as those described for the proposed project. Mitigation measures applicable to the proposed project would apply to this alternative, and, as with the proposed project, would reduce impacts of this alternative to less-than-significant levels.

V.F.2.4 Cultural Resources

The Non-LBNL Use Preservation Alternative would avoid the proposed LRDP's significant and unmitigable cultural resources impacts by ensuring that existing and yet-to-be designated historical resources that would otherwise be proposed for demolition would be retained and preserved in accordance with the Secretary of the Interior's Standards. Under this alternative, impacts to archaeological resources and the potential to disturb human remains would be reduced to less-than-significant levels with mitigation measures identified for the proposed project.

V.F.2.5 Geology and Soils

Geology and soils impacts under the Non-LBNL Use Preservation Alternative would generally be the same as described for the proposed project, and would be less than significant with implementation of mitigation measures applicable to the proposed project, as these measures would also apply to this alternative.

V.F.2.6 Hazards and Hazardous Materials

The potential hazards and hazardous materials impacts under the Non-LBNL Use Preservation Alternative would generally be the same as described for the proposed project, and would be less than significant with implementation of mitigation measures applicable to the proposed project, as these measures would also apply to this alternative.

V.F.2.7 Hydrology and Water Quality

The potential hydrology and water quality impacts under the Non-LBNL Use Preservation Alternative would generally be the same as described for the proposed project, and would be less than significant, as with the project.

V.F.2.8 Land Use and Planning

Land use impacts under this alternative would be the same as described for the proposed project, and would be less than significant, as with the proposed project.

V.F.2.9 Noise

The Non-LBNL Use Preservation Alternative would result in construction noise impacts similar to those of the proposed project. Mitigation measures identified for the proposed project would also apply to this alternative. As with the proposed project, individual construction and/or demolition projects undertaken under this alternative could result in noise impacts that could not be fully mitigated. Operational noise impacts would be less than significant, as with the project.

V.F.2.10 Population and Housing

The Non-LBNL Use Preservation Alternative would result in the same less-than-significant population and housing impacts as those of the project.

V.F.2.11 Public Services and Recreation

The ADP on the hill site under the Non-LBNL Use Preservation Alternative would be the same as that under the proposed project, and thus the demand for fire services, police services, schools, and parks and recreation would be essentially the same, and impacts to public services would be essentially the same as the less-than-significant impacts of the proposed project.

V.F.2.12 Transportation/Traffic

The Non-LBNL Use Preservation Alternative would result in the same amount of development and parking spaces on the hill site compared to the proposed LRDP project, and therefore traffic, parking, pedestrian, bicycle, and transit impacts would be the same as those identified for the project. Like the project, this alternative would result in significant unmitigable project (and cumulative) impacts at three intersections: Hearst Avenue at Gayley Road/La Loma Avenue, Gayley Road/Stadium Rim Way, and Durant Avenue/Piedmont Avenue. (Mitigation identified for the latter two intersections under the project would apply under this alternative, but could not be implemented by the Lab on its own.) Other transportation impacts would be less than significant, with mitigation where identified for the project.

V.F.2.13 Utilities, Service Systems, and Energy

The ADP on the hill site under the Non-LBNL Use Preservation Alternative would be the same as that under the proposed project. Therefore, the demand for utilities, service systems, and energy would be essentially the same, and impacts would be essentially the same as the impacts of the proposed project. Mitigation measures applicable to the proposed project to reduce potential impacts to less-than-significant levels would apply to this alternative.

V.G. Off-Site Alternative

V.G.1 Description

The Off-Site Alternative proposes that all development under the 2006 LRDP, including increases in ADP, occupiable building space and parking spaces, would be accommodated at the hill site and at an off-site location in the Bay Area, specifically the Richmond Field Station (RFS). The RFS is currently owned by The UC Regents. It occupies approximately 162 acres on the shore of San Francisco Bay, about six miles to the northwest of the LBNL main site. The RFS site consists of approximately 90 acres of upland, industrially zoned land that is used primarily for research and development, and 72 acres of marsh and tidal mudflat. The site is in a historically industrialized zone. At the RFS, an ADP of 390 would be accommodated, and 383,800 square feet. of new occupiable building space and 225 new parking spaces would be constructed.

The development program at the hill site would accommodate the remaining projected growth under the 2006 LRDP, and would be the same as the Reduced Growth 1 Alternative. Under the Off-Site Alternative, development at the hill site, compared to the 2006 LRDP, would represent

63 percent of the occupiable building space, about three-quarters of the ADP, and 75 percent of the parking spaces proposed under the 2006 LRDP.

Taking into account LBNL growth at the hill site and the RFS under this alternative, the overall development potential at the 2025 planning horizon for the Lab would be the same as initially proposed in the 2006 LRDP when the Notice of Preparation was issued. While this alternative would meet key project objectives regarding levels of ADP, occupiable building space, and parking, this alternative would not meet the project objectives to expand functionality of Lab facilities, provide for cross-disciplinary research, or foster collaborative work environments among researchers, since it would result in a division of resources between locations.

V.G.2 Impacts

Environmental effects at the hill site under the Off-Site Alternative, as compared to the 2006 LRDP, would be the same as those discussed under the Reduced Growth 1 Alternative since the ADP, occupiable building space (including demolition and new construction activities), and parking facilities under this alternative would be identical.

V.G.2.1 Aesthetics

The Off-Site Alternative would result in new development at the RFS to accommodate a portion of the Lab's projected growth. At the RFS site, aesthetic impacts would not be expected to be significant. Due to regulatory restrictions and the continued use of parts of the RFS site for research, construction of new buildings at the RFS site would likely occur outside of areas where sensitive biological and wetland resources are present. This requirement would likewise help to avoid aesthetic impacts by locating a development away from the shoreline. Also, the RFS site is generally zoned for and surrounded by industrial development; therefore, development of laboratory buildings would be consistent with surrounding development patterns and would not present an aesthetic intrusion.

With respect to the Lab's main hill site, as stated in Section IV.A, implementation of the proposed 2006 LRDP would alter views of the LBNL site from nearby areas, including the Lawrence Hall of Science and residential neighborhoods and commercial areas in the cities of Berkeley and Oakland. In general, views of the Lab hill site would be incrementally intensified because additional buildings would be visible, although no buildings would be constructed of a height and/or without sufficient screening such that they would dramatically stand out from existing Lab development in long-range views of the hillside. While some observers would not consider the changes in the existing visual setting to be substantial, visual quality is subjective, and different observers may have different reactions to changes in long-range views of the Lab's hill site, with some people likely to find the increase in building density, even though partially screened, to be disruptive or even offensive. Therefore, for purposes of a conservative analysis, this EIR concludes that the proposed LRDP, as described by the Illustrative Development Scenario shown in the visual simulations, would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially damage scenic resources. Because the Off-Site Alternative would still develop more than half of the Lab's new space at the main hill site, visual impacts would remain significant and unavoidable with implementation of this alternative, as with the project. Also as with the project, light and glare impacts would be less than significant with mitigation and construction-period and cumulative impacts would be less than significant.

V.G.2.2 Air Quality

Compared to the proposed project, the Off-Site Alternative would result in similar construction air quality impacts, and mitigation measures adopted as part of the proposed project would also apply under this alternative. Less development at the hill site would result in proportionately lower local air quality impacts than the 2006 LRDP, and impacts would be less than significant. The project's contribution to regional air quality emissions would be comparable to the emissions analyzed for the proposed project since the overall level of new development would be the same as initially proposed under the 2006 LRDP when the Notice of Preparation was issued. As with the project, this alternative would result in a cumulative significant impact with regard to toxic air contaminant emissions.

V.G.2.3 Biological Resources

Biological resources impacts at the hill site would be similar to those of described for the proposed project, although they would be incrementally lower than those of the 2006 LRDP since less development would occur. Mitigation measures applicable to the proposed project would also apply to this alternative, reducing impacts at the hill site to less-than-significant levels. The Off-Site Alternative would increase the developed area at the RFS and would potentially affect sensitive biological resources at the site, including native grasslands, coastal salt marsh, raptor nesting, and possibly roosting locations for special-status bat species. Construction of new buildings at the RFS site would likely occur outside of the areas where sensitive biological and wetland resources are present, due to regulatory restrictions and the continued use of those parts of the site for research. With mitigation similar to that identified for the LBNL hill site, impacts to biological resources at the RFS site would be likely be less than significant.

V.G.2.4 Cultural Resources

The Off-Site Alternative would result in cultural resources impacts similar to those of the proposed project, resulting in a significant and unavoidable impact at the hill site due to the loss of historical resources. Significant and unavoidable impacts related to demolition and construction activities that could affect as-yet unidentified historical resources, and the demolition of the Bevatron, would remain under this alternative. Mitigation measures applicable to the proposed project to reduce impacts to archaeological resources and the potential to disturb human remains would apply to this alternative, and, as with the proposed project, would reduce impacts to less-than-significant levels.

V.G.2.5 Geology and Soils

Geology and soils impacts at the hill site under the Off-Site Alternative would generally be the same as described for the proposed project, although less development on the hill site, and therefore a lower ADP, would reduce the exposure to geologic and seismic hazards. Mitigation measures applicable to the proposed project would apply to this alternative, and would reduce impacts at the hill site to less-than-significant levels. No apparent geologic constraints exist at the RFS site that would result in unmitigable geologic or seismic hazards. With mitigation, geology and soils impacts at the RFS site would be less than significant.

V.G.2.6 Hazards and Hazardous Materials

Hazards and hazardous materials impacts at the hill site under the Off-Site Alternative would generally be the same as described for the proposed project, although impacts associated with hazards and hazardous materials would be incrementally less, corresponding with less development at the hill site under this alternative. The RFS site has a history of soil and groundwater contamination. Any residual contamination would be required to be remediated in compliance with applicable regulatory standards prior to implementation of the Off-Site Alternative. At the LBNL main site, mitigation measures applicable to the proposed project would apply to this alternative and would reduce impacts to less-than-significant levels.

V.G.2.7 Hydrology and Water Quality

Hydrology and water quality impacts at the hill site under the Off-Site Alternative would generally be the same as described for the proposed project, although impacts would be incrementally less, corresponding with less development on the hill site under this alternative. Additional development at the RFS site would likely increase the amount of impermeable surface at that site, with associated increases in stormwater runoff and surface contaminants. To the extent that infrastructural improvements would be necessary to accommodate these increases, they would likely be required, and the resulting impacts to hydrology, drainage, and water quality would be less than significant.

V.G.2.8 Land Use and Planning

The land use and planning impacts of the Off-Site Alternative would be the same as described for the proposed project since this alternative would result in a similar mix of land use on the hill site, albeit at a lesser development intensity. While this alternative would increase development at the RFS site, because the RFS includes existing research uses and is located near industrial uses on land that is zoned for such uses, this alternative would not introduce incompatible land uses to the RFS site. As with the proposed project, land use impacts would be less than significant.

V.G.2.9 Noise

Construction noise impacts and the increase in the ambient noise level at the hill site under the Off-Site Alternative would be incrementally less than the proposed project. The decrease in noise impacts would result from less construction and demolition activity, as well as a smaller overall development program at the hill site. Mitigation measures adopted as part of the proposed project would apply to this alternative and would reduce the severity of these impacts, but likely not to a less-than-significant level, and construction noise would remain significant and unavoidable, as with the project. While this alternative would increase development at the RFS, there are fewer sensitive receptors in the vicinity of the RFS, compared to the hill site. Additionally, new construction at the RFS would be subject to the proposed project's construction noise mitigation measures to reduce impacts to less-than-significant levels. As with the proposed project, operational noise impacts would be less than significant with mitigation.

V.G.2.10 Population and Housing

The population and housing impacts of the proposed project are regional in nature, since the Lab's ADP originates from locations throughout the Bay Area. Therefore, impacts under the Off-Site Alternative would be similar to the project's less-than-significant population and housing impacts. Demand for housing in the vicinity of the RFS could increase and demand for housing in the immediate vicinity of the hill site could decrease, compared to the proposed project, under this alternative. As with the project, the impacts attributable to increases in the population and housing demand under this alternative would be less than significant.

V.G.2.11 Public Services and Recreation

The ADP on the hill site under the Off-Site Alternative would be roughly three-quarters of the ADP under the proposed project; therefore, the demand for public services at the hill site would be proportionately lower. At the RFS, the University provides police protection, with emergency service available from the Richmond Police Department. The Richmond Fire Department provides emergency fire response services. The Off-Site Alternative would result in incremental increases in demands for these public services, but impacts to public services under this alternative would be less than significant.

V.G.2.12 Transportation/Traffic

Under the Off-Site Alternative, the transportation/traffic effects at the hill site, as compared to the 2006 LRDP, would be the same as those discussed under the Reduced Growth 1 Alternative because the ADP, occupiable building space (including demolition and new construction activities), and parking facilities on the hill site would be identical under the two alternatives. This alternative would therefore have a less-than-significant impact on the intersection of Hearst Avenue at Gayley Road/La Loma Avenue, rather than the significant and unavoidable impact that the 2006 LRDP project would have, for the reasons explained for the Reduced Growth 1 Alternative. Similar to the proposed project, the installation of traffic signals at two other intersections (Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue) would be necessary to mitigate significant impacts, and mitigation measures identified for the project (installation of traffic signals) would be required to reduce these impacts to less-than-significant levels. Also as with the project, because LBNL could not implement these measures on its own, the impact at these intersections would be considered significant and unavoidable. Compared to the proposed project, this alternative would result in incrementally lesser transit impacts, while pedestrian, bicycle, and parking impacts would be similar; these impacts would all be less than significant. The Off-Site Alternative would result in new development at the RFS to accommodate a portion of the Lab's projected growth, which would in turn increase shuttle and private-vehicle trip generation to and from the RFS. The increase of 390 ADP at the RFS site could increase traffic congestion at local intersections in the RFS vicinity and would be potentially significant, pending assessment of specific site and operations plans.

V.G.2.13 Utilities, Service Systems, and Energy

The Off-Site Alternative would result in lower development and associated demand for utilities, service systems and energy at the hill site. Mitigation measures applicable to the proposed project to reduce potential impacts to less-than-significant levels would also apply to this alternative. Utility, service system and energy demand at the RFS would increase under this alternative, but based on the provision of utilities for existing research and other activities at the RFS site, it is anticipated that sufficient utilities and service systems would be able to be made available for further development at the site. Moreover, any future development at the RFS site would be required to fund its fair share of the infrastructure improvements necessary to support it. Impacts to utilities and service systems would therefore be less than significant with mitigation.

V.H References – Alternatives

NPS (National Park Service), "Mothballing Historic Buildings," by Sharon C. Park, AIA. Preservation Brief 31, Technical Preservation Services. Washington DC: 1993.

Lawrence Berkeley National Laboratory (LBNL), *Demolition of Building 51 and the Bevatron Draft EIR*, October 21, 2005.

CHAPTER VI
CEQA Considerations

Introduction

This section summarizes the findings with respect to significant, unavoidable environmental impacts; growth-inducing impacts; cumulative impacts of the proposed project; and significant irreversible changes.

VI.A. Significant, Unavoidable Effects

As described in Chapter IV, implementation of the LRDP would result in the following significant impacts that could not be mitigated to a less-than-significant level:

VI.A.1 Aesthetics

Impact VIS-2: The proposed project could alter views of the LBNL site, and could result in a substantial adverse effect to a scenic vista or substantially damage scenic resources.

Impact VIS-3: The proposed project would alter the existing visual character of the Lab site and could substantially degrade the existing visual character and quality of the site and its surroundings.

> The Lab's hill site would continue to appear as a vegetated hillside with buildings among trees and shrubs. The natural and manmade topography of the site limits views from any one vantage point to a relatively small portion of the hill site, and development under the LRDP would be guided by the LRDP principles and strategies and LBNL Design Guidelines. Although changes to the site would occur in the context of existing development and not affect pristine views, some of the visual impacts might appear substantial to at least some viewers. In other instances, while the overall visual character of the site may remain similar, there might be substantial new buildings included in the vista. Moreover, some observers might perceive a substantial adverse change in the on-site visual character from construction of individual buildings. Given that aesthetic impacts are inherently somewhat subjective, and given the totality of potential development even though many individual buildings would not have a substantial effect, and also to provide a conservative analysis that avoids any possible under-estimation of impacts, this EIR concludes that the project would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially damage scenic resources. In light of the above, the project's effect on aesthetics and visual quality is determined to be significant.

VI.A.2 Air Quality

Cumulative Impact AQ-6: Even though cumulative emissions of toxic air contaminants would decrease, implementation of the LBNL 2006 LRDP, in combination with other potential contributing projects, would contribute to cumulative emissions of toxic air contaminants that result in an excess cancer risk that exceeds, and would continue to exceed, 10 in one million.

Implementation of the proposed 2006 LRDP would not result in a project-specific increase in lifetime cancer risk at off-site receptors in excess of 10 cases in one million, and this impact would be less than significant. (One on-site receptor would sustain increased cancer risk of greater than 10 in one million, but this significant impact was found to be reduced to a less-than-significant level with implementation of mitigation identified in the DEIR.) Nevertheless, the lifetime cancer risk from exposure to emissions from Berkeley Lab, including emissions from mobile sources such as the Lab's shuttle buses and from auto and truck traffic entering and leaving the Lab, would continue to exceed 10 in one million, even though there would be no project-related increases in excess of that threshold. Although the Lab's contribution to total lifetime cancer risk at any location would be relatively small, compared to the average risk of 480 in one million throughout the Bay Area, this EIR considers the contribution to be considerable, and therefore the cumulative impact would be significant.

VI.A.3 Cultural Resources

Impact CUL-1: Implementation of the 2006 LRDP could cause a substantial adverse change in the significance of historical resources, as defined in CEQA Guidelines Section 15064.5, including historical resources that have not yet been identified.

Although analyzed in a separate EIR, demolition of Building 51 (including the Bevatron) would occur during the lifetime of the LRDP and, because this EIR considers Building 51 as part of the existing setting, demolition of Building 51 would be a significant and unavoidable impact of the 2006 LRDP, as well. Along with previously completed Historic American Engineering Record (HAER) documentation, which included a written historical and architectural description of the building and accelerator, and extensive photographic recordation, LBNL would prepare a Historic American Building Survey (HABS) addendum to the HAER and also would create a monument and/or display regarding the history of the Bevatron. These mitigation measures would reduce the effects of demolition of Building 51, but not to a less-than-significant level. Concerning other potential historical resources, preliminary research findings suggest that Building 71 and Building 88 may be eligible for listing in the National Register. There are no current plans to demolish Buildings 71 and 88. However, should the buildings prove to be eligible for National Register listing, their demolition under the 2006 LRDP would result in a significant and unavoidable impact, even with mitigation identified in the DEIR. Should SHPO identify other buildings at LBNL as eligible for listing on the National Register, their demolition under the 2006 LRDP would also result in a significant and unavoidable impact, even with mitigation identified in the DEIR.

VI.A.4 Noise

Impact NOISE-1: Development under the proposed LRDP would result in temporary noise impacts related to construction and demolition activities.

Cumulative Impact NOISE-5: Development under the proposed LRDP would result in temporary contributions to cumulative noise impacts related to construction and demolition activities.

> Although in most instances, it can reasonably be anticipated that construction noise impacts on off-site receptors would be reduced to a less-than-significant level through implementation of the above mitigation measures, there may be individual construction and/or demolition projects undertaken during the life of the 2006 LRDP that result in noise impacts that could not be fully mitigated. Therefore, the impact of construction noise is considered to be significant and unavoidable.

VI.A.5 Transportation

Impact TRANS-1: Implementation of the 2006 LRDP would degrade level of service at certain local intersections.

Cumulative Impact TRANS-8: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding development in Berkeley and nearby communities that could affect the study intersections, would contribute to a degradation of level of service at local intersections.

> Installation of a traffic signal would mitigate the significant impacts at two intersections to a less-than-significant level: Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue. Because LBNL could not implement these measures on its own, but would need the cooperation of UC Berkeley and/or the City of Berkeley, the impact at these intersections also would be considered significant and unavoidable. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible measure(s). In addition, LBNL shall develop and implement a new Transportation Demand Management (TDM) Program to replace its existing TDM program. The new TDM Program has been drafted in consultation with the City of Berkeley, and includes several implementation phases tied to the addition of parking to LBNL. The TDM will include a TDM coordinator and transportation committee, an annual inventory of parking spaces and a gate count, a study of more aggressive TDM measures, investigation of a possible parking fee, investigation of sharing services with UC Berkeley and an alternative fuels program. The new TDM Program also includes a requirement that LBNL conduct an additional traffic study to reevaluate traffic impacts on the earliest to occur of 10 years following the certification of this EIR or the time at which the Lab formally proposes a project that will bring total development of parking spaces pursuant to the 2006 LRDP to or above 375 additional parking spaces.

Mitigation measures have been identified for all other significant impacts identified in this EIR. Therefore, no other impacts were determined to be significant and unavoidable.

VI.B. Growth Inducement

As described in Section III.J, Population and Housing, the project would increase in the number of people working at LBNL but would not induce substantial population growth in the City of Berkeley or elsewhere in the region, either directly or indirectly. The proposed LRDP, in conjunction with the UC Berkeley 2020 LRDP and other projects that could be developed in Berkeley, would induce population growth in the City of Berkeley and the Bay Area, but the contribution of the 2006 LRDP to this impact would not be cumulatively considerable.

VI.C. Cumulative Impacts

The California Environmental Quality Act (CEQA) defines cumulative impacts as two or more individual effects which, when considered together, are substantial or which compound or increase other environmental impacts. The cumulative analysis is intended to describe the "incremental impact of the project when added to other, closely related past, present, or reasonably foreseeable probable future projects" which can result from "individually minor but collectively significant projects taking place over a period of time (state CEQA *Guidelines* Section 15355).

Cumulative impacts that may occur as a result of the project are discussed in the appropriate sections of Chapter IV of this report. The cumulative analysis in each section of Chapter IV considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the 2001 City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex—housing the Bevatron accelerator—although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Also included in the cumulative development assumptions are several projects at LBNL that are proceeding or could proceed separately from the 2006 LRDP, although in some cases the impacts of these projects are also included in the analysis of the 2006 LRDP for purposes of a conservative assessment of overall project impacts. These projects include:

- Demolition of Building 51 and the Bevatron: The approximately 180-foot diameter Bevatron was constructed as a proton synchrotron – a particle accelerator that accelerated protons within a beam pipe to near the speed of light. During its operation from 1954 until 1993, the Bevatron was among the world's leading accelerators. Building 51 is a large, approximately 126,500-gross-square-foot steel-frame shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop, and office functions. Under the proposed project, the Bevatron apparatus would be disassembled, Building 51 and the foundation underneath the building demolished, and the resulting debris and other materials removed. The site would then be backfilled, and the fill compacted and leveled. There are no firm plans for future development of the underlying site at this time.

  Demolition would entail the removal of approximately 20,000 to 26,000 tons of reinforced concrete, structural steel, siding, glass, and other building materials: 12,000 to 16,000 tons of reinforced concrete shielding blocks and 12,000 to 15,000 tons of Bevatron materials, mostly metals, such as yokes, support steel and equipment.

The duration of the physical work for the project may vary from four to seven years, and would take place between approximately 2008 and 2012 or later, contingent upon funding and results of material sampling

A Draft EIR for the Bevatron demolition project, tiered from the 1987 LRDP DIR, as amended, has been prepared and circulated for public review.

- User Support Building: This proposed three-story, approximately 30,000 gsf building would consist of assembly space, support laboratories, and offices in support of the Advanced Light Source user facility at LBNL. An Initial Study / Negative Declaration for CEQA and a NEPA Environmental Assessment or Categorical Exclusion are expected to be prepared and circulated in the fall / winter of 2006. This building would occupy space currently occupied by Building 10, which is obsolete and would be demolished. Demolition and construction would take place between early 2008 and mid 2010. (See Appendix D for further details.)

- Computational Research and Theory (CRT) Building: As currently projected, the CRT Building would likely be proposed as a six-story, 65,000-gsf building constructed near the Blackberry Gate entrance to the Lab main site. It would provide high-end computing floor space and accompanying office space to support the Lab's National Energy Research Scientific Computing (NERSC) Center, which is currently operating within the confines of an off-site leased site. CEQA review would be conducted and an appropriate document circulated for public review sometime around mid-2007. (See Appendix D for further details.)

- Helios Research Facility: As currently projected, the Helios Research Facility building would likely be proposed as a four-story, 100,000-gsf laboratory building constructed just south of existing LBNL buildings 66 and 62. The goal of the Helios Project is to accelerate the development of renewable and sustainable sources of energy using sunlight by developing fundamentally new and optimized materials for use in collectors, efficient processing steps, and energy handling. CEQA and NEPA review would be conducted and appropriate documents circulated for public review sometime around fall/winter 2008.

- The rehabilitation of Buildings 77 and 77A, already approved, which will replace the roof of Building 77; upgrade various utility systems in both buildings; add an interior crane to Building 77A; and construct a small nearby building to house chillers, a cooling tower, boilers, and associated equipment.

- As a condition of the Hazardous Waste Facility Permit issued by the Department of Toxic Substances Control (DTSC), LBNL has been required to investigate and address historical releases of hazardous wastes and materials that may have occurred at the site. Cleanup activities have already been conducted in some areas as part of Interim Corrective Measures that were implemented to protect human health or the environment. The final step of the cleanup process is to determine the best way to clean the remaining contamination and to begin the final clean up. The document evaluating possible cleanup methods and recommending which cleanup methods to implement, called the Corrective Measures Study Report, or CMS Report, was made available to the public and other agencies for their review and comment, and was approved by DTSC effective October 2005. The selected cleanup measures of the CMS Report are being put in place as part of the Corrective Measures Implementation phase of the RCRA Corrective Action Plan process.

- Development of an Animal Care Facility (ACF), planned as an approximately 7,100-gross-square-foot (gsf) one-story building located on the eastern side of the Lab's main hill site, northwest of Building 83. The ACF would replace the nearby existing 8,500-gsf animal care unit in Building 74, which is nearing obsolescence due to aging and unreliable mechanical equipment, and potential seismic inadequacy. If seismic upgrades are made to Building 74, the vacated space in that building likely would be converted to wet and dry laboratories and used for the same types of research activities, some of which already take place at Building 74 and others of which take place at other buildings at LBNL. The ACF is anticipated to be completed in 2007.
- Construction and operation of a new Guest House to serve visiting scientists, faculty and students. Many of the visitors using the Lab's facilities—the Advanced Light Source, National Center for Electron Microscopy, 88" Cyclotron, and Molecular Foundry—are from outside the Bay Area and must obtain short-term housing. The Guest House would be a 25,000-gsf, three-story building with approximately 60 guest rooms and would provide on-site, low-cost, short-term housing. The site designated for the Guest House is near the center of the Laboratory, west and southwest of Building 2 and on the site of the demolished Building 29 and Trailer 29D, and existing Trailers 29A, 29B, and 29C. Construction is anticipated to begin in early 2007 and be complete in mid-2008.

As noted, development pursuant to the UC Berkeley 2020 LRDP is assumed in the cumulative analyses in this EIR. The UC Berkeley 2020 LRDP and LRDP EIR project population increases of up to 12 percent (approximately 5,320 "heads") and built space increases of up to 18 percent (approximately 2.2 million gsf) by the year 2020. The Regents approved the UC Berkeley 2020 LRDP and certified the LRDP's EIR on January 20, 2005. The environmental analyses assumed no more than one million gsf of construction would be underway at any one time within the Campus Park, Adjacent Blocks, Southside and Hill Campus land use zones, which is approximately equal to the maximum level of construction that was underway at the time the Existing Setting data were collected in 2002 and 2003. Thus, the aggregate effects of the maximum level of construction foreseen under the UC Berkeley 2020 LRDP are already reflected in the existing setting. The UC Berkeley 2020 LRDP EIR also included a project-level analysis of the Chang-Lin Tien Center for East Asian Studies, two buildings totaling about 110,000 gsf, the first of which is under construction.

In October 2006, UC Berkeley completed a Tiered, Focused EIR for the Southeast Campus Integrated Projects (SCIP), which include seismic and program improvements at the California Memorial Stadium, including a 158,000-gsf athletic training center and 102,000 gsf of additional new academic and support space at the stadium; construction of a parking structure and sports field at the current site of Maxwell Family Field; construction of an 186,000 gsf building linking the Law and Business schools, landscape improvements at the Southeast Campus and Piedmont Avenue; interior improvements at selected buildings at the School of Law and the Haas Business School; and renovation and restoration of the Piedmont Avenue houses (five structures and site environs from 2222 to 2240 Piedmont Avenue). The SCIP EIR, tiered from the UC Berkeley 2020 LRDP EIR, identified significant, unavoidable impacts in the areas of aesthetics (effects on the character of Gayley Road and on views from Panoramic Hill); cultural resources (changes to Memorial Stadium, demolition of several structures, and alterations to buildings and landscape along Piedmont Avenue); geology (earthquake risk); noise (due to construction and demolition and due to the potential for additional events at the stadium); traffic (effects at the Durant/Piedmont and Bancroft/Piedmont intersections[1]); and utilities and service systems (increased demand on wastewater facilities) (UC Berkeley, 2006).

Additional projects currently under way at UC Berkeley are also accounted for in the LBNL 2006 LRDP EIR cumulative analysis. These include:

- Development of an Early Childhood Education Center, serving up to 78 children, on the north side of Haste Street, mid-block between Dana and Ellsworth Streets, anticipated to be complete in early 2007;
- Construction of Stanley Hall, a 285,000-gsf, eight-story building nearing completion at the East Gate of the campus next to the Hearst Memorial Mining Building;
- Development of the Center for Information Technology Research in the Interest of Society (CITRIS) Headquarters, located in the northeast section of the campus near the intersection of Hearst and LeRoy Avenues, a 142,000-gsf structure expected to be completed in 2008;
- Seismic retrofit the Bancroft Library, which is located in the central portion of the campus to the north of Wheeler Hall between South Hall Road and Sather Road, under way through 2007;
- Construction of a pedestrian bridge, connecting the north and south components of the Foothill housing project, over Hearst Avenue just east of Gayley Road, to provide Americans with Disabilities Act-compliant access (expected completion in early 2007).

Finally, the cumulative analyses include development within the city of Berkeley as envisioned in the 2001 City of Berkeley General Plan and EIR. The 2001 City of Berkeley General Plan allows for steady growth and development, but, given a lack of substantial undeveloped space in the City, this would take place at a relatively even pace with an emphasis on infill development. Projections include a population increase of approximately 7,000 people (a roughly six percent increase), approximately 3,300 new household units (a roughly eight percent increase), and approximately 3,700 new jobs (a roughly five percent increase) by the year 2020.

VI.D. Significant Irreversible Changes

Certain aspects of development projects or the implementation of plans can result in irreversible environmental changes, such as when a General Plan directs a change in land use by committing a community to urbanization of farmland or when a project or plan extends urban services or transportation infrastructure to areas not currently so served. The use of large quantities of nonrenewable resources (e.g., fossil fuels) may also be considered such an irreversible change. Another type of irreversible change would be demolition, particularly of historical resources that, once gone, cannot be replaced.

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1 These impacts could be mitigated with the implementation of mitigation measures from the UC Berkeley 2020 LRDP EIR but are identified as significant and unavoidable because they are outside the jurisdiction of The Regents and could only be implemented at the discretion of the City of Berkeley.

The proposed 2006 LRDP would not result in irreversible changes related to land use. As noted in Section IV.H, Land Use, implementation of the 2006 LRDP could change the distribution of specific research-related uses at the main hill site, but would not fundamentally alter land use at the site, and Berkeley Lab would continue to operate as a scientific research institution.

The proposed 2006 LRDP would not extend services or roadways to areas not currently provided with such services. On-site utilities would be improved and capacity increased where necessary to serve the Lab but population growth at the Lab would be less than 1.5 percent per year, parking and traffic generation would increase by comparable amounts, and no significant impacts would ensue in connection with Population and Housing, Public Services, or Utilities, as described in Chapter III, Project Description, Section IV.J, Population, Section IV.K, Public Services, Section IV.L, Transportation, and Section IV.M, Utilities.

As described in Section IV.D, Cultural Resources, implementation of the 2006 LRDP would cause a substantial adverse change in the significance of historical resources, including historical resources that have not yet been identified. At a minimum, demolition of the Building 51 complex, including the Bevatron accelerator, is anticipated during the lifetime of the 2006 LRDP. This is identified as a significant, unavoidable impact in Section IV.D.

References –CEQA Considerations

UC (University of California) Berkeley, *Southeast Campus Integrated Projects Tiered Focused Final Environmental Impact Report (SCH #2005112056)*; October 31, 2006. Available on the internet at: http://www.cp.berkeley.edu/SCIP/FEIR/SCIP_FEIR.html

CHAPTER VII
Report Preparation

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CHAPTER IX
Acronyms and Abbreviations

$\mu g/m^3$	Micrograms per cubic meter
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACCWP	Alameda Countywide Clean Water Program
ACGIH	American Conference of Governmental Industrial Hygienists
ACM	Asbestos-containing materials
ADA	Americans with Disabilities Act
AMSL	Above Mean Sea Level
ANSI	American National Standards Institute
AOC	Area of Concern
ARB	California Air Resources Board
ASL	Advanced Light Source
AST	Aboveground storage tank
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BL	Biosafety Level
BMPs	Best Management Practices
Bq	Becquerel
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CARB	California Air Resources Board
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDMG	California State Department of Conservation, Division of Mines and Geology (now known as California Geological Survey)
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (a.k.a. Superfund)

CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CGS	California Department of Conservation, Geological Survey
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
Ci	Curie
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CUPA	Certified Unified Program Agency
CVC	California Vehicle Code
CWA	Clean Water Act
dB	Decibels
dBA	A-Weighted Decibels
DHS	(California) Department of Health Services
DOE	United States Department of Energy
DPM	Diesel Particulate Matter
DTSC	(California) Department of Toxic Substances Control
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EH&S	LBNL Environment, Health, and Safety (Division)
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Environmental Science Associates
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FY	Fiscal Year
gpd	Gallons per day
gsf	Gross square feet
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAPs	Hazardous Air Pollutants
HEPA filter	High Efficiency Particulate Air filters
HMMP	Hazardous Materials Management Plan
HVAC	Heating Ventilation Air Conditioning

HWHF	Hazardous Waste Handing Facility
Hz	Hertz
kv	Kilovolts
kVA	Kilovolt (Annual)
kW	Kilowatts
lb/day	Pounds Per Day
LBL/LBNL	Lawrence Berkeley Laboratory/Lawrence Berkeley National Laboratory
LEED	Leadership in Energy & Environmental Design
Leq	Energy-Equivalent Noise Level
LOS	Level of Service
LRDP	Long Range Development Plan
LTS	Less than Significant
MACT	Maximum Achievable Control Technology
MEI	Maximally Exposed Individual
mgd	Million Gallons Per Day
MM	Modified Mercalli
MOA	Memorandum of Agreement
mph	Miles Per Hour
MRZ	Mineral Resource Zones
MVA	Mega-Volt-Amperes
MWh	Megawatt hours
NAHC	Native American Heritage Commission
NCI	National Cancer Institute
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Airborne Pollutants
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NOx	Nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OEHHA	(California) Office of Environmental Health Hazard Assessment
OSHA	United States Occupational Health and Safety Administration
PCBs	Polychlorinated Biphenyls
PG&E	Pacific Gas & Electric Company
PM-10	Particulate Matter – 10 microns or smaller
PM-2.5	Particulate Matter – 2.5 microns or smaller
PNNL	Pacific Northwest National Laboratory

ppm	Parts Per Million
PRC	Public Resources Code
psi	Pounds Per Square Inch
Rad	Roentgen Absorbed Dose (a measure of radiation energy absorbed per gram of medium)
RCRA	Resource Conservation and Recovery Act
REL	Reference Exposure Level
rem	Roentgen Equivalent Man (a measure of biological harm done by radiation)
RfD	Reference Dose
ROG	Reactive Organic Gases
RWQCB	(California) Regional Water Quality Control Board (San Francisco Bay Region, unless otherwise noted)
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SEIR	Supplemental Environmental Impact Report
sf	Square feet
SHMA	Seismic Hazards Mapping Act
SHPO	State Historical Preservation Officer
SIP	State Implementation Plan (air quality plan)
SLAC	Stanford Linear Accelerator Center
SO_2	Sulfur Dioxide
SPCC	Spill Prevention Control and Countermeasure
SWMP	Storm Water Monitoring Plan
SWMU	Solid Waste Management Unit
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TCMs	Transportation Control Measures
TLV	Threshold Limit Value
TMDL	Total Maximum Daily Load
TSCA	Toxic Substances Control Act
UBC	Uniform Building Code
UC	University of California
UCB	University of California, Berkeley
UCOP	University of California, Office of the President
UCPD	UC Berkeley Police Department
URF	Unit Risk Factor
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

LAWRENCE BERKELEY NATIONAL LABORATORY LONG-RANGE DEVELOPMENT PLAN

Draft Environmental Impact Report / Appendices

Prepared for:
Lawrence Berkeley National Laboratory

January 22, 2007

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ESA

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Lawrence Berkeley National Laboratory Long-Range Development Plan Draft Environmental Impact Report

Appendices

APPENDIX A

Revised (October 2003) Notice of Preparation and Responses

Ernest Orlando Lawrence
Berkeley National Laboratory

One Cyclotron Road, MS 90K
Berkeley, California 94720

October 28, 2003

State of California
Office of Planning and Research
1400 Tenth Street
Sacramento, California 95814

REVISED NOTICE OF PREPARATION
DRAFT ENVIRONMENTAL IMPACT REPORT

Project Title:	LBNL 2004 Long Range Development Plan
Project Location:	Lawrence Berkeley National Laboratory
County:	Alameda County, California
SCH#:	2000102046

Project Description:
Lawrence Berkeley National Laboratory (LBNL or Berkeley Lab) proposes to prepare and adopt the 2004 Long Range Development Plan (LRDP). The 2004 LRDP will provide a physical development framework for implementing Berkeley Lab's mission through the year 2025.

Agency Review and Comments:
In compliance with the State and University of California Guidelines for implementation of the California Environmental Quality Act (CEQA), this Notice of Preparation is hereby sent to inform you that the Lawrence Berkeley National Laboratory is preparing a Draft Environmental Impact Report (EIR) on the 2004 LRDP.

As Lead Agency, we need to know the views of your agency as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project. (Anticipated areas of analysis are identified in the attached Initial Study). Please designate a contact person in your agency and send your response to the address below.

Environmental Review Process:
The University of California will be the Lead Agency and will prepare an EIR to evaluate the potential environmental effects of implementing the 2004 LRDP. This will include a programmatic level of environmental review of Berkeley Lab development through 2025.

The 2004 LRDP EIR will replace the 1987 LRDP EIR (as well as the 1992 Supplemental EIR and 1997 Addendum) when it has been certified and the proposed new LRDP has been approved by The UC Regents. The LRDP EIR will be designed to analyze a series of related actions at Lawrence Berkeley National Laboratory under the 2004 LRDP. It will contain a comprehensive and detailed analysis of environmental impacts of the 2004 LRDP. Subsequent activities within the scope of the 2004 LRDP will be analyzed to determine whether there are any impacts requiring further CEQA documentation or instead whether no documentation in addition to the LRDP EIR is required.

An Initial Study has been prepared pursuant to CEQA to identify the environmental issues that will be addressed in Berkeley Lab's 2004 LRDP EIR. The Initial Study is attached to this Notice of Preparation. Copies of the Initial Study are available for review at the main branch of the Berkeley Public Library, 2090 Kittredge Avenue, Berkeley, and on-line at http://www.lbl.gov/Community/env-rev-docs.html.lbl.gov.

Due to time limits mandated by State law, this NOP will include a 30-day comment period that extends from October 28, 2003 to November 26, 2003. Comments must be received before 5:00 pm on November 26, 2003 to be considered in the preparation of the LRDP EIR. They may be e-mailed to LRDP-EIR@lbl.gov or mailed to:

Jeff Philliber
Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90K
Berkeley, CA 94720

A public scoping meeting for the 2004 LRDP and EIR will be held from 7:00 PM to 9:00 PM on November 17, 2003 at the North Berkeley Senior Center, 1901 Hearst Avenue, Berkeley.

Sincerely,

Laura Chen, Chief
LBNL Facilities Planning

Enclosure: Initial Study Checklist

CC: State Agencies

State Clearinghouse
CA Air Resources Board, Dr. Alan C. Lloyd
CA Department of Fish and Game, Robert C. Hight, Director
CA Department of Health Services, Mr. Edgar Bailey, Chief, Radiological Health Branch, et. al.
CA Department of Water Resources, David Kennedy, Director
CA Environmental Protection Agency, Winston Hickox, Secretary, et. al.
CA EPA, Department of Toxic Substances Control, Sal Ciriello et. al.,
CA Regional Water Quality Control Board, Mr. Lawrence Kolb, Executive, et. al.
CA State Resources Agency, Ms. Mary D. Nichols, Secretary
CA State Water Resources Control Board, Ms. Heidi Temko, et. al.
CalTrans, Gary Adams, Chief, et. al.

Federal Agencies
U.S. Environmental Protection Agency, Region 9, Mr. Michael Bandrowski, et. al.
U.S. Fish and Wildlife Service, Sacramento Field Office, Wayne White, Supervisor,
U.S. Department of Energy, Berkeley Site Office, Mr. Richard Nolan, et. al.
U.S. Department of Energy, NEPA Compliance Officer, Janet M. Neville
U.S. Department of Energy, Oakland Office, Mr. Roger Little, et. al.

Regional/County Agencies
Alameda County, Supervisor District 5, Keith Carson
Alameda County LAFCO, Lon Ann Texeira, Executive Officer
Alameda County, Susan Muranishi, County Administrator
Alameda County, Health Care Agency, Public Health Officer, Arthur Chen et. al.
Alameda County, Clerk, Crystal Hishida
Alameda County Planning Department, James Sorenson, Director, et. al.
Metropolitan Transportation Commission Steve Heminger, Executive Director
Association of Bay Area Governments, Eugene Leong, et. al.
Bay Area Air Quality Management District, Brian Bateman, et. al.
Contra Costa County Department of Health Services, Andy Parsons
East Bay Municipal Utilities District, Dennis Diemer, General Manager, et. al.
East Bay Regional Park District, Pat O'Brien, General Manager, et. al.
Regional Water Quality Control Board, San Francisco Division, Keith Lichten, et. al.

City of Berkeley
Berkeley City Clerk, Ms. Sherry M. Kelly
Berkeley City Manager's Office, Mr. Phil Kamlarz, et. al.
City of Berkeley, City Attorney's Office, Manuela Albuquerque
City of Berkeley, Mayor Tom Bates, et. al.
City of Berkeley, Council Members Breland, Hawley, Maio, Olds, Shirek, Spring, Worthington, Wozniak
City of Berkeley, Department of Planning, Dan Marks, et. al.
City of Berkeley, Toxics Management Division, Dr. Nabil Al-Hadithy
City of Berkeley, Energy Officer, Neal DeSnoo
City of Berkeley, Peace & Justice Commission Secretary, Hector Manual
City of Berkeley, Parks & Waterfront Commission Secretary, Jay Kelekian
City of Berkeley, Solid Waste Management Commission Secretary, Tania Levy
City of Berkeley, Police Chief Roy Meissner
City of Berkeley, Fire Department, Reg Garcia, Chief, et. al.
City of Berkeley, Peter Hilliard, Transportation Manager

City of Oakland
City of Oakland Mayor Jerry Brown
City of Oakland, District 1, Jane Brunner, Councilmember
City of Oakland, City Attorney John Russo
City of Oakland, Planning and Zoning Division, Leslie Gould, Director
Oakland City Clerk's Office, Ceda Floyd
City of Oakland, Deborah Edgerly, Interim City Manager
City of Oakland, Fire Department, Gerald Simon, Chief, et. al.

City of Albany
City of Albany City Clerk Jacqueline Bucholz
City of Albany Administrator, Beth Pollard

Kensington
Kensington Fire District, Paul Wilson

University of California Office of the President (UCOP)
UCOP, Budget and University Relations, Bruce Darling, Vice-President
UCOP, Laboratory Administration, Howard Hatayama, Sr. VP
UCOP Office of General Counsel, Alan Waltner
UCOP Office of Planning, Design, & Construction, John Zimmermann, et. al.
UCOP Facilities Administration, Michael Bocchichio, Assistant Vice President

UC Berkeley
UC Berkeley, Chancellor Robert Berdahl
UC Berkeley, Exec. Vice Chancellor, Paul Gray
UC Berkeley, Vice Chancellor for Research, Beth Burnside
UC Berkeley, Vice Chancellor Business and Administrative Services, Horace Mitchell, et. al.
UC Berkeley, Physical and Environmental Planning, Tom Lollini, Director, et. al.
UC Berkeley, Chancellor's Adv. Committee on Strawberry Creek, G. Mathias Kondolf
UC Berkeley, EH&S Division, Mark Frieberg, et. al.
UC Berkeley, Office of Radiation Safety, Paul Lavely, Director, et. al.
UC Berkeley, Community Relations, Irene Hegarty, Director
UC Berkeley, Lawrence Hall of Science, Elizabeth Stage, Director et. al.
UC Berkeley, Botanical Garden, Ellen Sims, Director, et. al.
UC Berkeley, Police Chief, Victoria Harrison
UC Berkeley, Campus Landscape Architect, James Horner
UC Berkeley, Emergency Services Manager, Tom Klatt

Organizations
Berkeley Association of Realtors, Donald Clark, Executive Director
Berkeley Chamber of Commerce, Rachel Rupert et. al.
Campus Parnassus Neighborhood Association, Eric Arens
Committee to Minimize Toxic Waste, Pam Sihvola, Co-Chair, et. al.
Community Environmental Advisory Commission, Sara MacKusick
Council of Neighborhood Associations, Marie Bowman, President
Euclid-LeConte Neighbors, Jim Sharp et. al.
League of Women Voters, Nancy Bickel, President, et. al.
Nyingma Institute, Abby Blum
Oakland Metropolitan Chamber of Commerce, Joseph Haraburda
Panoramic Neighborhood Association, Janice Thomas, President
Urban Creeks Council, Carol Schemmerling
Friends of Strawberry Creek, Janet Byron

Individuals and Neighbors
(Various)

Ernest Orlando Lawrence
Berkeley National Laboratory

One Cyclotron Road, MS 90K
Berkeley, California 94720

October 28, 2003

INITIAL STUDY
2004 LONG RANGE DEVELOPMENT PLAN
LAWRENCE BERKELEY NATIONAL LABORATORY

I. PROJECT INFORMATION

Project Title: 2004 Long Range Development Plan

Lead Agency: University of California

Contact Person: Jeff Philliber; (510) 486-5257

Project Location: One Cyclotron Road, Berkeley, California 94720

State Clearinghouse #: 2000102046

II. PROJECT DESCRIPTION

See Below.

III. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below may be potentially affected by this project and will be carried forward for full analysis in the LRDP EIR:

■	Aesthetics		Agriculture Resources	■	Air Quality
■	Biological Resources	■	Cultural Resources	■	Geology/Soils
■	Hazards & Haz. Materials	■	Hydrology/Water Quality	■	Land Use/Planning
	Mineral Resources	■	Noise	■	Population/Housing
■	Public Services	■	Recreation	■	Transportation/Traffic
■	Utilities/Service Systems	■	Mandatory Findings of Significance		

IV. DETERMINATION: (To be completed by the Lead Agency)

On the basis of the initial evaluation that follows:

_______ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

_______ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

■ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

_______ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. A TIERED ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

_______ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental document is required. FINDINGS consistent with this determination will be prepared.

Signature Date

Laura Chen

Printed Name Chief, LBNL Facilities Planning

LBNL 2004 LRDP
PROJECT DESCRIPTION

Introduction

Lawrence Berkeley National Laboratory (LBNL or Berkeley Lab) is a multi-program national research facility operated by the University of California (UC) for the Department of Energy (DOE)'s missions in fundamental science, energy resources and environmental quality. LBNL's programs advance four distinct goals for DOE and the nation:

- To perform leading multidisciplinary research in the computing sciences, physical sciences, energy sciences, biosciences, and general sciences in a manner that ensures employee and public safety and protection of the environment.
- To develop and operate unique national experimental facilities for qualified investigators.
- To educate and train future generations of scientists and engineers to promote national science and education.
- To transfer knowledge and technological innovations and to foster productive relationships among the Lab's research programs, universities, and industry in order to promote national economic competitiveness.

Classified research is not conducted at LBNL.

Background

University of California campuses, including LBNL, are required to maintain and periodically update Long Range Development Plans (LRDPs). An LRDP is a planning document that establishes a general framework and direction for the physical development of an institution over a span of several years. The University of California further mandates that any new LRDP be accompanied by an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA). An EIR provides a comprehensive review and analysis of a proposed project and of its potential effects on the environment. An EIR analysis is presented for review and comment to the public, to relevant government agencies, and to the Lead Agency (in this case, UC) decision-makers. Any new LBNL LRDP and EIR must be approved by The Regents of the University of California before the EIR can be adopted and the LRDP can be implemented.

LBNL's existing LRDP and EIR were approved in 1987. The EIR was later updated by a Supplemental EIR in 1992 and an Addendum in 1997. Sufficient time has passed that a renewed statement of planning vision is appropriate for Berkeley Lab as it works to address the national scientific challenges and research opportunities at the beginning of this new century.

LBNL had begun the long range planning process with a previous LRDP EIR Notice of Preparation in the fall of 2000. Because the schedule for completion and circulation of the LRDP and EIR was delayed, this revised Notice of Preparation has been issued. With this revised Notice of Preparation, the LRDP and CEQA process recommences. Berkeley Lab expects to complete and circulate the Draft LRDP and Draft EIR for public review in Spring 2004. Berkeley Lab plans to submit the proposed Final LRDP and EIR documents for The UC Regents' consideration during Fall 2004.

Setting

The main LBNL site straddles the border between the cities of Berkeley and Oakland in Alameda County adjacent to the UC Berkeley campus (see Figures 1 and 2). The site is situated on the ridges and in the draws of Blackberry and Strawberry Canyons in the East Bay Hills. To the west are UC Berkeley student and general residential neighborhoods; to the north are single-family residential neighborhoods, the Lawrence Hall of Science, and other rurally set recreational and cultural facilities and parking uses; to the east and southeast are University-owned rural lands including designated ecological study area and botanical gardens; and to the south and southwest are the University of California, Berkeley, recreational facilities, and single-family residential neighborhoods (see Figure 3).

The approximately 200-acre main LBNL site (or "Hill site," see figure 2) includes approximately 1.76 million gross square feet (gsf) of building space consisting mainly of office, laboratory, shop, and storage areas. Additional development includes roads, parking lots, utilities, and infrastructure. Approximately 25 percent of the site is developed (impermeable surface area) while the remaining approximately 75 percent is generally permeable and/or undeveloped, although historically agriculturally-used or otherwise managed areas. The latter areas are hosts to a variety of mostly non-native grasses, brush, and woodlands. LBNL's undeveloped areas are subject to on-going vegetation management for fire control purposes.

LBNL occupies approximately 400,000 gsf of office, laboratory, and storage space off of the LBNL Hill site. This includes approximately 100,000 gsf on UC-owned land on the UC Berkeley Campus, and approximately 295,000 gsf of commercial/industrial lease space primarily in the cities of Berkeley, Oakland, Walnut Creek, and Washington, D.C. The amount of off-site space occupied and the location of this space changes as needs and market conditions change.

The LBNL Hill site includes three vehicular entry gates and generates several thousand one-way (access and egress) vehicle trips on a typical workday. The site currently contains approximately 2,200 employee parking spaces, and the current objective for Berkeley Lab's parking-to-employee ratio is 1.7 employees for every parking space for the Lab's current adjusted daily population of about 4,300. The Lab offers free employee and guest shuttle service throughout the workday, both on- and off-site, and maintains incentives for carpooling and alternative forms of transportation.

LBNL's landscape management areas include stands of eucalyptus, bay, oak, redwoods, and Monterey pine; scrub and brush; and grasslands. No rare, endangered, threatened, or otherwise listed plant or animal species have been sighted at LBNL. The Berkeley Lab site contains several mostly seasonal and intermittent waterways and drainages and is part of the Strawberry Creek watershed. No jurisdictional wetlands or blue-line streams exist on the site. An on-going vegetation management program for wildland fire control consists of periodic tree-thinning and pruning and regular brush and grass maintenance activities.

The Cooper's hawk, a California species of concern, and the Red-tailed hawk, which is protected under California Fish and Game Code Section 3505.5, have been observed within the Lab environs. In addition, in 2000, the US Fish and Wildlife Service (USFWS) designated a large portion of Alameda and Contra Costa Counties as habitat for the Alameda whipsnake—a species previously listed as "threatened." This critical habitat listing included areas within the LBNL Hill site. No Alameda whipsnake has been reported at the LBNL site, and a 1996 survey conducted by a whipsnake expert reported that only a small portion of the LBNL site (less than five acres) actually contains any viable or colonizable Alameda whipsnake habitat. The USFWS critical habitat listing for the Alameda whipsnake was vacated by a Federal district court in 2003.

While some LBNL buildings are over fifty years old, virtually all of these have been substantially modified over the years. LBNL is conducting a sitewide review of historic resources in coordination with the Department of Energy and the State Historic Preservation Office. Based on archaeological surveys of the Hill site, as well as on decades of construction-related excavation, no archaeological or Native American sites are thought to exist on the LBNL site.

1987 LRDP and EIR

At present, Berkeley Lab's on- and off-hill site facilities are host to an average daily population of approximately 4,300 staff and guests. Under the current, approved LRDP and LRDP EIR, as amended, Berkeley Lab may grow by approximately 450 staff and guests above current levels to a total of 4,750 staff and guests, and may develop or occupy an additional 238,000 gsf on site to a total of 2 million gsf (see Table I). In addition, the 1987 LRDP and EIR, as amended, project that LBNL off-hill (non-UC-owned land) space use will be 100,000 gsf by an unspecified date within the 21st Century ("20XX").

2004 LRDP

Project Description

The project under consideration in this EIR will be LBNL's proposed new LRDP. The LRDP will be a planning document that will address continuing and future uses and activities at Berkeley Lab. The LRDP planning period will extend through 2025, although the actual pace and nature of projected development will depend on a number of factors that cannot all be predicted at this time; these include future funding levels and the future direction of national research. For the purposes of environmental analysis, an approximately twenty-year timeframe will be used.

While the LRDP planning process is not complete, LBNL has developed some general parameters for the Plan. These parameters, discussed below, are the result of preliminary planning and may be refined or adjusted as a result of the on-going planning process.

The objectives of this proposed LRDP reflect the evolution of the Lab, its mission, and the climate of scientific research since the issuance of the 1987 LRDP. The anticipated primary LRDP objectives are:

- Provide research and support facilities to accommodate research program and associated population growth.
- Secure and sustain investment in research facilities.
- Improve overall operational and scientific efficiencies.
- Strengthen the core site plan concept of multiple, consolidated functional areas.
- Improve research and support operations through proper siting and consolidation of functions, including the relocation of off-site and UCB research activities to the main Hill site.

- Develop facilities that foster innovation and collaboration.
- Protect the environment through exemplary sustainable design and operational practices.
- Plan for site amenities and constraints.
- Provide a setting that attracts and retains leading research talent in a safe, healthful, and attractive work environment.
- Provide a flexible land use policy that accommodates the rapidly changing nature of scientific research.

LRDP Scope

The 2004 LRDP will guide the physical development of Berkeley Lab to achieve the best possible balance among the Lab's mission; staff, user, and visitor needs for state of the art research and support facilities and services; the environmental character of the site; and a harmonious integration with the surrounding community. The LRDP will not be per se an implementation plan; rather, it will be a guide to implementation. Adoption of the LRDP will not constitute a commitment to any specific development projects, construction schedules, or funding priorities. Specifically, this LRDP will:

- Summarize the Laboratory's setting, planning processes, planning concepts and design objectives.
- Identify population growth and space needs projections to the twenty-year horizon year.
- Define the physical context for facilities development on the main Hill site.
- Indicate redevelopment needs for existing buildings and utility systems.
- Summarize site amenities and constraints to protect the environment and natural setting.
- Provide a land use plan and accompanying design principles and themes as a guide for the location and qualitative aspects of new development.

Population Growth Projections

Over the next twenty years, the "adjusted daily population" (ADP) at the Hill site is expected to grow from the current 4,300 to 5,500. The ADP counts both staff and guests and is adjusted to account for the normal fluctuations in guest attendance. This average growth rate of approximately 1.1% per year would be less than LBNL's annual population growth rate of about 1.3% per year since adoption of the 1987 LRDP. This forecasted population would represent an increase of approximately 28% over the current LBNL population and approximately 16% over the 1987 LRDP population projection of 4,750.[1]

Space Needs Projections

Currently, LBNL occupies 2,180,000 gsf, including a combined total of about 1,760,000 gsf at the main Hill site, about 99,000 gsf at the UCB campus, and approximately 295,000 gsf of leased space distributed over multiple sites, for a combined total of 2,155,501 gsf. Implementation of the 2004 LRDP would increase the Lab's main Hill site total building area to approximately 2,560,000 gsf.[1]

Table 1

	Current Level	**Current Projection (1987 LRDP/EIR)**	**Projected Future (2025) Level**
Population (ADP)	4,300	4,750	5,500
Space[1]			
On-Hill space	1.76 M	2.00 M	2.56 M
Off-Hill space at UCB[2]	0.10 M	0.30 M	0.10 M

[1] – in Millions square feet
[2] – Does not include off-site lease space, which will change as needs and/or market conditions allow.

Off-Hill functions may continue to operate at their current locations or at the other sites as conditions warrant. LBNL does not expect to increase space occupied on the UC Berkeley campus park, but the mix of office and laboratory space may change over time. It is anticipated that LBNL's special status space in Calvin and Donner laboratory buildings on the UC Berkeley campus will continue in these or other negotiated buildings on the UC Berkeley campus. LBNL's off-Hill Commercial lease space will fluxuate as needs and market conditions allow.

Land Use

The Land Use Plan will identify general zones of development intensity rather than areas of specific use types. The three development zones that will comprise the plan are expected to be:

- **Facilities Development Area –** research and support activities. Would encompass primarily the already developed central portion of the Lab. New development of

[1] Revisions to text were made to correct overstatements in NOP, per errata sheet issued to the State Clearinghouse on October 31, 2003.

laboratory, office, and support structures would be allowed throughout this zone. Final building locations and massing would not be dictated by the land use plan but would be the result of a comprehensive planning process. The LRDP would promote development on infill and existing building sites and would look to consolidating research activities.

- **Vegetation Management Areas –** managed landscape, wildland fire and natural areas. Would be located entirely along the perimeter of the LBNL site and would provide an open space buffer to neighboring land uses. Vegetation in these areas would continue to be managed to reduce wildland fire risks. Environmental monitoring structures and access roadways would be allowed in these areas.

- **Special Habitat Protection Areas –** no regular vegetation management or development is anticipated. Would provide for protection of identified special status species habitats and riparian zones.

Since the 1987 LRDP, approximately 66 acres of Regents'-owned land formerly managed by UC Berkeley have been added to LBNL's management area. These acres are currently managed under existing land use designations provided under the current UC Berkeley LRDP until LBNL's new LRDP is adopted by The Regents. At such time, these acres will be assigned new land use designations by the Berkeley Lab LRDP. This land currently includes "Ecological Study Area" zone and "Natural" area designations under the UC Berkeley LRDP, and it is actively managed by LBNL for vegetation and fire management purposes. The lands currently designated as Ecological Study Area zones under the 1990 UC Berkeley LRDP are anticipated to be designated "managed areas" under the new Berkeley Lab LRDP.

Proposed Major Planning Policies

Based upon the Lab's mission, population growth projections, and space needs forecast, policies are being formulated to serve as a guide to the continuing development of the LBNL main site. These draft policies include the following:

Facilities

- Develop flexible facilities that meet changing needs of research programs
- Design buildings to work with hillside topography
- Design buildings as leading examples of sustainable design principles
- Develop and maintain flexible and accessible utility infrastructure

Environmental Character

- Establish the built form as a strong sense of place to facilitate interactive work and social life that will help to attract and retain top researchers

- Commit to integrate natural and man-made environments

- Optimize the potential of open space, views, and landscape as valuable, distinguishing amenities
- Continue vegetation management to minimize wildland fire risk

Growth & Development

- Accommodate changing space and support needs of scientific research
- Accommodate program population and space growth
- Balance approach to new development
- Replace old low density with new space efficient facilities
- Promote sustainable development
- Promote opportunities for third-party development

Land Use

- Co-locate interdependent research programs in clusters
- Promote infill development sites reinforcing the cluster concept
- Assign land use in accordance with sustainable guidelines
- Site development adjacent to existing development and utilities

Circulation and Transportation

- Promote alternative forms of transportation
- Provide parking to support a campus like setting and increased population
- When possible, segregate service and employee/visitor traffic

Plan Concept: Hill Town Research Clusters

The 2004 LRDP will advance the concept of development in research clusters defined by the hillside topography, natural features, and the character of the built environment. These clusters will be known as individual “hill towns” with their own unique character and themes. The Lab campus as a whole will maintain a cohesive sense of place primarily from the unifying force of the natural setting. Further development of common elements such as pedestrian walkways, site structures, landscaping and signage will further bind the unique hill town settings into a unified whole.

These hill towns provide a place to concentrate research activities either by research Division or by project into “research clusters.” The hill town analogy provides a framework to guide the site planning strategies, development principles, and design themes unique to each hill town. Further, as hill towns, by necessity, tend to concentrate activities and space, these development principles and themes reinforce a primary LRDP objective to provide higher density facilities that foster opportunities for collaboration.

Construction Program

The 2004 LRDP will envision project construction as a series of activities that takes place sequentially and, at times, simultaneously at the Lab site. Consequently, the 2004 LRDP EIR will analyze construction as an on-going activity based upon expected annual averages as opposed to as a series of discrete, temporary, and unrelated actions that are deferred to future, segregated analyses.

Environmental Impact Report

The 2004 LRDP EIR will replace the 1987 LRDP EIR (as well as the 1992 Supplemental EIR and 1997 Addendum) when it has been certified and the proposed new LRDP has been approved by The UC Regents. The 2004 LRDP EIR will be designed to analyze a series of related actions at Lawrence Berkeley National Laboratory under the 2004 LRDP. It will contain a comprehensive and detailed analysis of environmental impacts of the 2004 LRDP. Subsequent activities within the scope of the 2004 LRDP will be analyzed to determine whether there are any impacts requiring further CEQA documentation or instead whether no documentation in addition to the LRDP EIR is required.

The EIR analyses of potential LRDP effects on environmental resources shall include the following areas: Aesthetics; Air Quality; Biological Resources; Cultural Resources; Geology, Seismicity, and Soils; Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use and Planning; Noise; Population and Housing; Public Services; Recreation; Transportation; and, Utilities and Service Systems. The EIR will include analysis of other considerations required by CEQA.

The LRDP EIR will also consider the combined effects of the proposed LRDP program in concert with past, present, and probable future projects producing related or cumulative impacts. Among these are LBNL's on-going activities, UC Berkeley's projected new Long Range Development Plan, and the City of Berkeley's recently-approved General Plan update.

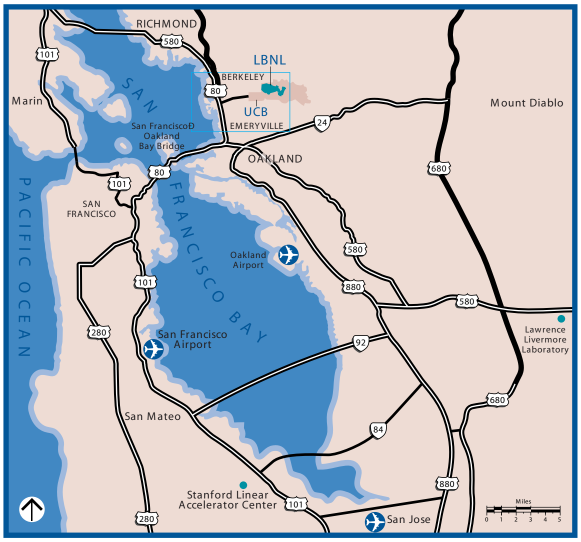
Alternatives

The LRDP EIR will include an examination of alternatives to the project, including the "no project" alternative required by CEQA. While the final list of alternatives will be developed in conjunction with the environmental analyses, likely alternatives to be included are:

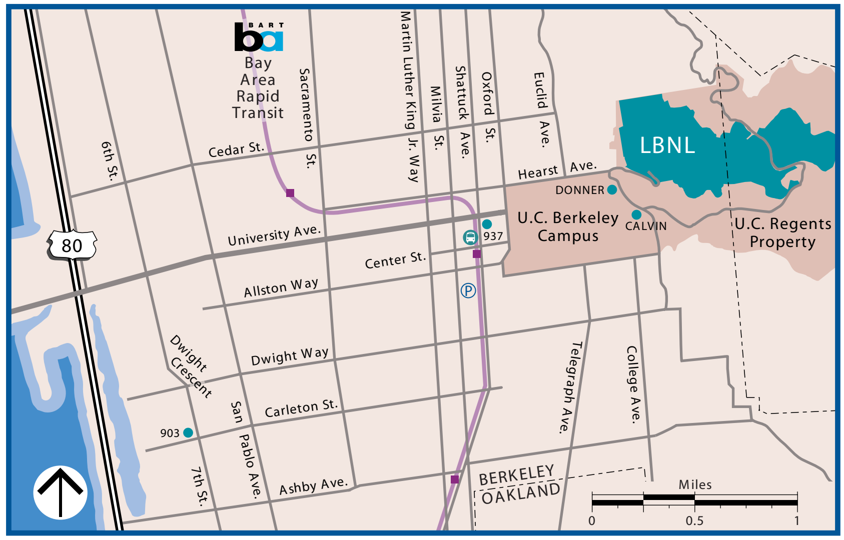
- **Reduced On-Site Population Growth:** Under this alternative, space growth would be similar to that of the proposed project, but population growth would be limited.
- **Reduced On-site Space Growth:** Under this alternative, population growth would be similar to that of the proposed project, but space growth would be limited. Staff compression and/or off-site leases of space would be emphasized under this alternative.
- **Reduced or No New On-site parking growth**: Under this alternative, growth of population and space would continue as projected, but fewer or no new parking spaces would be provided. Alternative modes of transportation would be emphasized to a greater degree under this alternative than under the proposed LRDP.
- **Satellite or Second Campus Development Off-site:** Under this alternative, LBNL would concentrate new facilities and population growth in an off-site area such as in an industrial park.
- **No Project :** Under this alternative, LBNL would not develop beyond the parameters described in the 1987 LRDP.

Cortese List

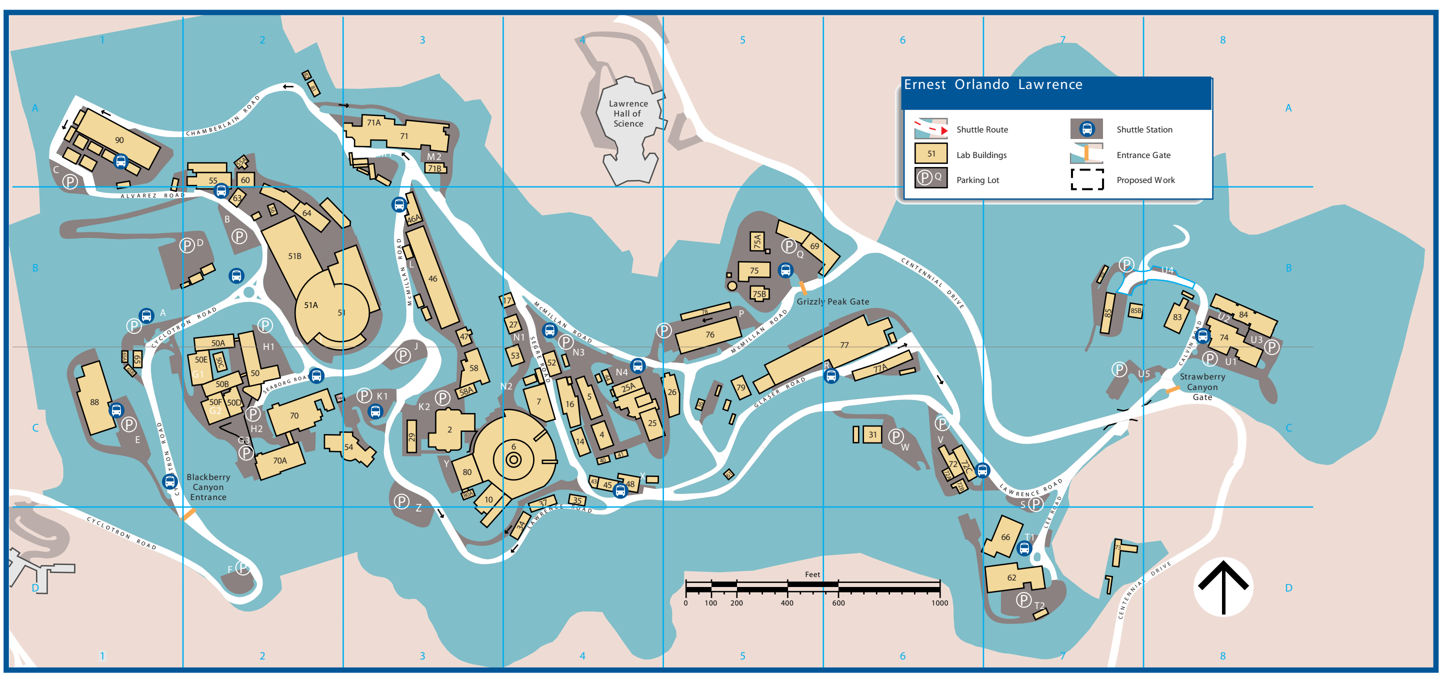
As required by Public Resources Code Section 21092.6, information regarding LBNL locations on the CAL/EPA Hazardous Waste and Substances Sites List, or "Cortese List," are provided at the following URL: http://www.lbl.gov/Community/env-rev-docs.html



LBNL Regional Location



LBNL Local Location



LBNL Site

Figure 1: Regional, Local, and Site Location Maps

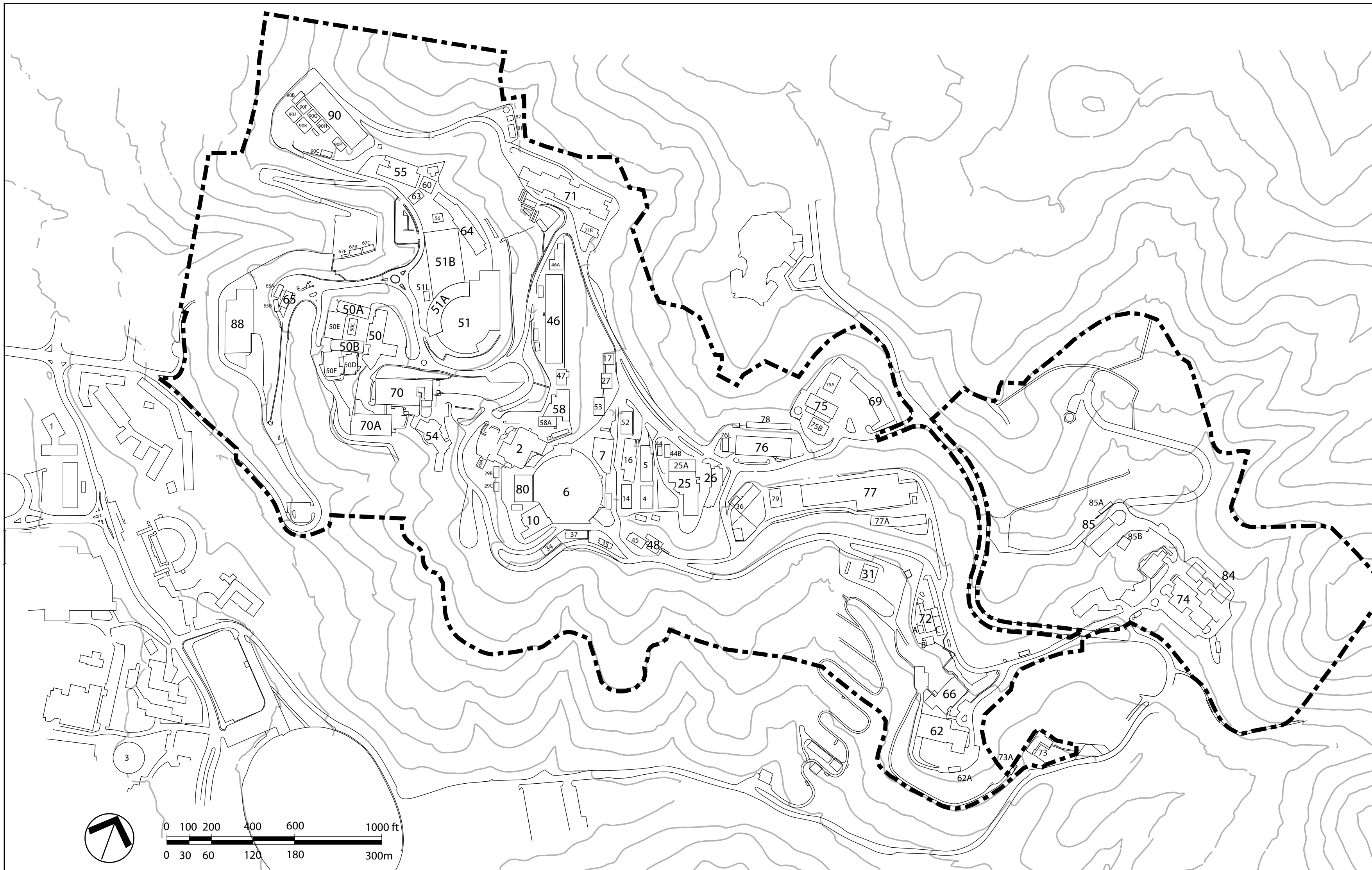
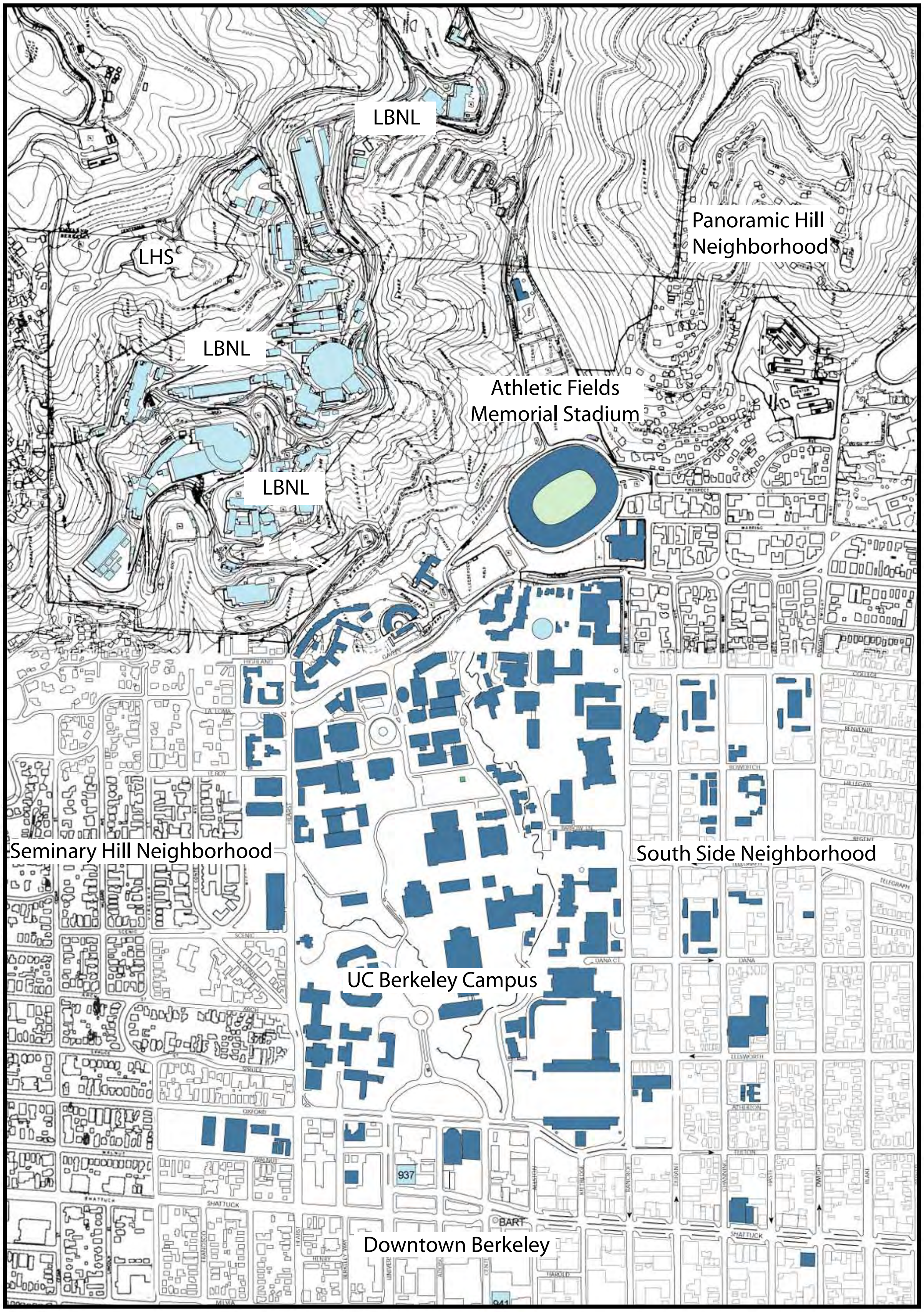


Figure 2: LBNL Site Map



LHS -- Lawrence Hall of Science

Lawrence Berkeley National Laboratory

Figure 3: Land Uses in LBNL Vicinity

October 28, 2003

Potential Effects

The following is a preliminary assessment of potential environmental impacts that may be analyzed in the LRDP EIR. This assessment will be used as part of the information considered in determining the scope of environmental issues to be evaluated in preparing the EIR.[1] The EIR will consider all areas below. Topic areas that are expected to be impacted by the proposed project will be fully analyzed. Topic areas not expected to be impacted will be addressed briefly or in depth as appropriate.

	Will be Analyzed in EIR	No Additional Analysis Required
1. AESTHETICS -- Would the project:		
a) Have a substantial adverse effect on a scenic vista?	■	□
Project-related development on-site may be noticeable from numerous off-site viewpoints, including University Avenue in Berkeley, the Campanile on the UC Berkeley Campus, the Lawrence Hall of Science, and segments of Grizzly Peak Boulevard. Development would likely include the addition of new visual elements, such as buildings, and by the removal of natural or screening elements, like key screening trees. One likely measure of effect from viewpoints downhill would be whether such visual changes would substantially alter the existing visual character of the LBNL portion of the Berkeley hills, which are characterized by a mix of buildings surrounded by trees, foliage, and natural-appearing topography. A measure of effect from viewpoints uphill would be whether such visual changes would block or substantially detract from panoramic, long-range views of the San Francisco Bay and distant skyline. The LRDP likely would include LBNL aesthetic design guidelines to be incorporated into any development projects.		
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	□	■
No LBNL on-site resources are within or in the vicinity of a state scenic highway. Regional access to the LBNL hill site is provided by Interstate Highways 80 and 580, and State Routes 24 and 13. None of these are designated or presently eligible as scenic routes. Therefore, no impact would occur to a state scenic highway and additional analysis is not required.		
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	■	□
LRDP-related on-site development would likely occur on both currently developed and undeveloped areas. Over the planning period, the project could introduce new buildings and structures to the site, remove existing buildings, alter the terrain and landscape, and remove and/or add key screening trees. It could change existing land uses and intensify development in some areas. Due to distance, elevation, and intervening terrain and vegetation, new development would not be expected to appear highly visible from most off-site viewpoints. One likely measure of effect from viewpoints downhill would be whether such visual changes would substantially alter the existing visual character of the LBNL portion of the Berkeley hills, which are characterized by a mix of buildings surrounded by trees, foliage, and natural-appearing topography. LRDP would be expected to include LBNL aesthetic design guidelines to be incorporated into any development projects.		

[1] Brief explanations are provided in shaded boxes. These explanations represent a best estimate based on the current preliminary understanding of the proposed LRDP and its likely effects.

	Will be Analyzed in EIR	No Additional Analysis Required
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	■	□
With the potential inclusion of new buildings, intensification or change of land uses, and removal of screening trees, LRDP-related on-site development could create new sources of light and glare visible from off-site viewpoints. The LRDP would be expected to include LBNL aesthetic design guidelines to be incorporated into any development projects.		
2. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:		
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	□	■
No active agriculturally-used lands occur on the LBNL site.		
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	□	■
No active agriculturally-used lands occur on the LBNL site.		
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	□	■
No active agriculturally-used lands occur on the LBNL site.		
3. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:		
a) Conflict with or obstruct implementation of the applicable air quality plan?	■	□

	Will be Analyzed in EIR	No Additional Analysis Required
The LBNL site is located in the Bay Area Air Quality Management District (BAAQMD), an area that is currently designated a non-attainment zone for PM_{10} (particulate matter with a nominal diameter of 10 microns or less) and ozone levels. LRDP-related increases in LBNL staff, laboratory space, equipment, and construction activities would be likely to add incrementally to regional ambient air pollutant emissions, including short- and long-term emissions of criteria air pollutants from mobile and stationary sources, including PM_{10} and ozone. This would not advance the goals of the relevant air quality implementation plan for PM_{10} and ozone, although LRDP-related emissions increases would likely be very minor on a regional level. Standard emission control and reduction measures, such as dust control for excavation, use of alternative fuel vehicles on-site, free shuttle service to public transportation, filtration on exhaust systems, etc., are likely to be identified in the LRDP where appropriate.		
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	■	□
The LRDP EIR will examine the potential for vehicle and stationary source emissions under the project to violate state and federal air quality standards or contribute to existing air quality violations. The potential for mobile source, construction and operational emissions associated with 2004 LRDP implementation to influence air quality would be examined. The analysis will include examination of criteria pollutants, toxic air contaminants, and airborne radionuclides that might potentially result from project implementation.		
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	■	□
The BAAQMD is designated as a non-attainment area for ozone and PM_{10} standards, so any increased LBNL contribution of these emissions to the region would likely constitute an adverse cumulative impact. The LRDP EIR will examine the cumulative projection of total emissions through 2025 — including those of the proposed project, the UC Berkeley 2020 LRDP, and the City of Berkeley General Plan — to determine whether increases in non-attainment criteria pollutants would be cumulatively considerable.		
d) Expose sensitive receptors to substantial pollutant concentrations?	■	□
The LRDP EIR will evaluate whether construction and development activities under the 2004 LRDP would expose sensitive receptors, including nearby schools, to substantial pollutant concentrations.		
e) Create objectionable odors affecting a substantial number of people?	■	□

	Will be Analyzed in EIR	No Additional Analysis Required
Ongoing activities from the proposed project are not expected to create nuisance or objectionable odors affecting substantial numbers of people, particularly people off-site. Actions that might create objectionable odors include asphalt-laying during construction activities. Such odors would be temporary and likely noticeable to a small number of off-site people, and then only under limited meteorological conditions. The prevailing wind directions measured on site typically do not blow in the direction of nearby populated areas during normal LBNL operating hours. Nevertheless, the LRDP EIR will examine the potential for objectionable odors resulting from implementation of the 2004 LRDP.		
f) Expose people to substantial levels of toxic air contaminants (TACs), such that the exposure could cause an incremental human cancer risk greater than 10 in one million or exceed a hazard index of one for the maximally exposed individual?	■	□
Development under the 2004 LRDP could add research facilities or expand existing campus uses that are potential sources of toxic air contaminants (TACs). The 2004 LRDP EIR will include estimates for emissions from development under the 2004 LRDP. If the 2004 LRDP would result in an excess cancer risk greater than 10 in one million or exceed a hazard index of one, a significant impact would be assumed to result and be addressed in the EIR. Calculated cancer risks assume a continuous exposure time of 70 years, which provides a conservative analysis because most exposures are of much shorter duration. The hazard index assumes a one-hour exposure to maximum hourly emissions from all LBNL site sources, which provides a conservative analysis because maximum hourly emissions from all sources are not expected to simultaneously occur within one hour.		
4. BIOLOGICAL RESOURCES – Would the project:		
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	■	□
In 2000, the US Fish and Wildlife Service (USFWS) designated a substantial portion of the eastern LBNL site as critical habitat for the “threatened” Alameda whipsnake. There have never been reported sitings of the Alameda whipsnake species at LBNL, and most of the habitat so designated by the USFWS had been earlier reported as not “colonizable” in a sitewide survey prepared by a leading whipsnake expert for LBNL (McGinnis, 1996). In 2003, a Federal district court vacated the 2000 USFWS critical habitat listing for the Alameda whipsnake. Nevertheless, LBNL continues to operate with a heightened degree of sensitivity towards potential whipsnake presence on all undeveloped areas of its site. Similarly, LBNL recognizes that habitat for or members of various special status birds, bats, reptiles, amphibians, and other species of concern may exist in the area and must be accounted for in Berkeley Lab’s planning. In addition, Cooper’s hawk and Red-tailed hawk, both special status species, have been observed at LBNL. The 2004 LRDP EIR will examine the potential for development under the LRDP to adversely affect candidate, sensitive, or special status species or their habitat.		

	Will be Analyzed in EIR	No Additional Analysis Required
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	■	☐
LBNL contains several drainages and a wide range of both native and non-native plant species on-site. The 2004 LRDP EIR will include a sitewide survey to identify any riparian or sensitive natural communities on the LBNL hill site. Any such areas will be considered in the analysis of LRDP implementation.		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	■	☐
The LRDP EIR will include a sitewide survey to identify any jurisdictional wetlands as defined under Section 404 of the Clean Water Act. Although jurisdictional waters of the United States exist on the Berkeley Lab site, no known federally protected wetlands are thought to exist on-site.		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	■	☐
The LBNL site is not known to serve as a migratory corridor or nursery site to any native resident or migratory species. Site surveys will be conducted to confirm this.		
e) Conflict with any local applicable policies protecting biological resources?	■	☐
The LRDP EIR will evaluate the consistency of the 2004 LRDP with federal and state plans, policies, laws and regulations, such as the Migratory Bird Treaty Act, that are relevant to potentially occurring biological resources. Local ordinances do not apply to Lab projects, because the University is a state agency exempted from local controls in accordance with the state constitution.		
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other applicable habitat conservation plan?	■	☐
The LBNL site is not known to be subject to or designated for any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved conservation plan. The LRDP EIR will investigate and confirm this.		
5. CULTURAL RESOURCES -- Would the project:		

	Will be Analyzed in EIR	No Additional Analysis Required
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	■	□
The LRDP likely would encourage reuse or redevelopment of functionally obsolete buildings when opportunities for new development arise. Several LBNL buildings are or are approaching 50 years of age and have been associated with LBNL’s scientific work. A historic survey is being conducted to assist in determining which structures at Berkeley Lab may be historical resources as defined in CEQA Section 15064.5, and how many among them might be eligible for the National Register of Historic Places pursuant to the National Historic Preservation Act. The results of this survey, as available, will be included in the EIR analysis.		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	■	□
There are no known archaeological resources on the LBNL site. No archaeological artifacts have been discovered during Lab development and excavation, and archaeological field surveys of the site have uncovered no evidence of prehistoric inhabitation or the presence of archaeological resources. Nevertheless, potential for discovery of unexpected archaeological resources during project development and excavation under the 2004 LRDP program will be examined in the LRDP EIR.		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	□	■
The LBNL site does not contain any known unique paleontological resources or unique geologic features. During the course of development at Berkeley Lab, extensive excavation for buildings and infrastructure have not revealed the presence of unique paleontological or geologic resources. No impact would occur, and no additional analysis is required.		
d) Disturb any human remains, including those interred outside of formal cemeteries?	■	□
See response to 5b, above. There is no known evidence of prehistoric habitation of the LBNL site, nor any indication that the site has been used for burial purposes either in the recent or distant past. The LRDP EIR will identify actions to be taken to mitigate any impacts that might occur in the unlikely event that human remains were disturbed by implementation of the 2004 LRDP.		
6. GEOLOGY AND SOILS -- Would the project:		
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:		

	Will be Analyzed in EIR	**No Additional Analysis Required**
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	■	□
The LBNL site is near the Hayward Fault, and some portions of Berkeley Lab fall within the Alquist-Priolo Earthquake Fault Zone. LRDP-related increases in on-site personnel and building space would create additional exposure to earthquake risk. LBNL observes all applicable earthquake and safety codes in its construction and has evaluated and rated all structures in accordance with the University Seismic Safety Policy. The LRDP EIR shall examine the relationships between LBNL future development and known faults, and will analyze potential risk due to seismic shaking, ground failure, and landslides.		
ii) Strong seismic ground shaking?	■	□
See response to 6a-i, above. The LRDP EIR will analyze the potential increased seismic shaking-related risk from increased population and built space on the LBNL site due to implementation of the 2004 LRDP.		
iii) Seismic-related ground failure, including liquefaction?	■	□
See response to 6a-i, above. The LRDP EIR will analyze the potential increased ground failure-related risk from increased population and built space on the LBNL site due to implementation of the 2004 LRDP.		
iv) Landslides?	■	□
The LBNL site includes steep slopes and retained areas. LRDP-related increases in on-site personnel and building space would create additional exposure to landslide risk, especially during seismic events. See response to 6a-I, above. The LRDP EIR will analyze the potential increased landslide-related risk from increased population and built space on the LBNL site due to implementation of the 2004 LRDP.		
b) Result in substantial soil erosion or the loss of topsoil?	■	□
Erosion could occur during construction and excavation projects on the LBNL site. LBNL undertakes appropriate construction management practices to minimize the extent of such effects. The LRDP EIR will examine the potential loss of topsoil and potential for substantial soil erosion under the 2004 LRDP development program.		

	Will be Analyzed in EIR	No Additional Analysis Required
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	■	☐
Implementation of the LRDP EIR is not likely to include development on areas of unstable or unsuitable soils. Future development under the LRDP would be required to meet all building standards and codes for structural integrity and personnel safety. As described in 6.a., above, the potential for development under the 2004 LRDP to occur on lands that expose people or properties to risk due to landslide, liquefaction, or other soils-related condition will be examined in the LRDP EIR;		
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life or property?	■	☐
As described above, the potential for 2004 LRDP development to expose people or property to increased risk due to landslide, liquefaction, or other soils-related condition such as expansive soils, will be examined in the LRDP EIR.		
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	■	☐
The LBNL site is served by sanitary sewer systems; thus, this topic does not need to be further analyzed in the LRDP EIR.		
7. HAZARDS AND HAZARDOUS MATERIALS – Would the project:		
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	■	☐

	Will be Analyzed in EIR	No Additional Analysis Required
The presence and use of hazardous materials, and the presence of hazardous waste, provides potential exposure risks to workers, the public, and the environment. These risks during routine transport, use, and disposal are reduced to less than significant levels by a wide variety of measures undertaken by the Laboratory, including compliance with applicable laws and regulations governing hazardous materials and hazardous waste management activities, and the use of Berkeley Lab's Hazardous Waste Handling Facility meeting all applicable regulatory requirements. Hazardous waste is sent to authorized treatment and disposal facilities using licensed transporters. The Laboratory also has an extensive hazardous waste minimization program. Like many older facilities at which hazardous materials have been handled, the Laboratory site includes some areas of contaminated soil and groundwater. The Laboratory undertakes detection, investigation, and remediation activities in accordance with regulatory requirements. In the judgment of regulatory agencies, past releases of hazardous materials at the Laboratory have not created significant hazards to the public or environment. LRDP-related development would not be expected to create any significant new hazardous materials issues at LBNL. Implementation of the 2004 LRDP could result in the development of additional research laboratories and other research facilities that would use, store, and require the transportation of hazardous materials and disposal of hazardous waste. Also, solvents, adhesives, cements, paints, cleaning agents, degreasers, and fuels in construction and other vehicles are among the types of existing hazardous materials used at Berkeley Lab that could increase if the 2004 LRDP is implemented. The LRDP EIR will characterize on-site hazardous materials use, transport and disposal, will identify projected increases in these activities that could occur under the LRDP program, and will evaluate potential impacts associated with these increased activities.		
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	■	□
Upset and accident conditions could expose workers, the public, and the environment to risks from releases of hazardous materials and hazardous waste. The risk of releases currently is reduced to less than significant levels by such measures as complying with Building and Fire Code provisions governing the design of earthquake- and fire-resistant structures, implementing a fuel reduction/vegetation management program that reduces fire hazards from surrounding vegetation, and maintaining necessary emergency preparedness and response capabilities. The LRDP EIR will characterize hazardous waste handling and hazardous materials use in research, operations, maintenance, and construction, along with their transport, handling and disposal. It will identify projected increases in these activities that could occur under the 2004 LRDP and will evaluate associated potential impacts, including potential risks from upset or accident conditions.		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	■	□

	Will be Analyzed in EIR	No Additional Analysis Required
Although it is adjacent to the UC Berkeley campus, LBNL is not located within one-quarter mile of an existing or proposed school per CEQA Guideline 15186. The Lawrence Hall of Science, which is not a school but an educational institution (science museum) serving many school-aged visitors, is approximately 350 feet from Berkeley Lab's northern property line. In addition, LBNL-used space on the UC Berkeley campus may include some laboratory use of hazardous materials within one-quarter mile of schools or day care centers. While LBNL does handle certain hazardous materials in its capacity as a scientific laboratory, these materials and their handling protocols are subject to extensive regulations and procedures and oversight; they are also on-going activities that are described and approved under the 1987 LRDP and LRDP EIR. Beyond allowing for growth of normal LBNL operations and activities, the proposed LRDP is not anticipated to result in major new sources of on-site hazardous materials or handling. Nevertheless, the EIR shall include analysis of any project-related hazards that could affect the Lawrence Hall of Science and other neighbors.		
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	■	☐
Five LBNL locations are listed on the current CAL/EPA Hazardous Waste and Substances Sites List, also known as the "Cortese list." These sites may be found at: http://www.lbl.gov/Community/env-rev-docs.html . All are listed due to past leaks from underground fuel storage tanks. Corrective action was implemented by the Laboratory, and the local regulatory agency responsible for oversight (City of Berkeley, Toxics Management Division) has approved No Further Action status for four out of the five sites. Interim corrective measures are in place at the remaining site. The sites do not create a significant hazard to the public or the environment. Contamination from the sites has not gone beyond Laboratory boundaries, and has not created any known adverse impacts to on- or off-site personnel, wildlife, or vegetation. (The presence of a site on the hazardous materials sites list does not necessarily indicate a significant hazard. Once a location has been listed, it remains on the list even after all contamination has been removed. This policy enables parties to discover whether tanks or contamination exist or formerly existed on properties where ownership may be transferred.) These sites will be briefly identified and discussed in the LRDP EIR.		
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	■
The LBNL site is neither within an airport land use plan nor within the vicinity of an airport.		
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	■
The LBNL site is not within the vicinity of a private airstrip.		
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	■	☐

	Will be Analyzed in EIR	No Additional Analysis Required
The LRDP likely would require that all operations and development conform or be compatible with all elements of LBNL's site emergency response and evacuation plans.		
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	■	□
The LRDP EIR will analyze the LRDP-related risks involved with wildland fires. LRDP-related increases in on-site personnel and development would result in increased exposure of persons to potential wildland fire conditions. LBNL is on sloped terrain and adjacent to both urban areas and wildlands and is subject to dry, warm conditions and occasional high winds during the fire season. LBNL has considerable on-site fire suppression capabilities and its on-site fire department, which is maintained under contract with Alameda County, maintains mutual assistance arrangements with neighboring fire districts, and has implemented a fuel reduction/vegetation management program that has greatly reduced the risk of wildland fire in the vicinity of the Lab. All buildings are code compliant and are protected by sprinkler systems or other appropriate measures. LBNL maintains two 200,000-gallon emergency water tanks on site (with a third 200,000-gallon tank under construction) to ensure adequate emergency water supply and pressure, and construction of a third will soon be underway. Any LRDP-related new structures would be constructed under similar conditions and to applicable fire and safety codes.		
8. HYDROLOGY AND WATER QUALITY – Would the project:		
a) Violate any water quality standards or waste discharge requirements?	■	□
Development under the 2004 LRDP could result in an increase of impermeable surface area, which could produce additional volume and pollutant loading of urban runoff. The Regional Water Quality Control Board has expressed water quality concerns for Strawberry Creek and its receiving waters (the San Francisco Bay) based on releases of sediment, bacteria, nutrients, metals and hydrocarbons. Additionally, increased water usage that could result from implementation of the 2004 LRDP could cause increases in wastewater discharges that could exceed waste discharge requirements for water quality or quantity. The LRDP EIR will evaluate impacts to water quality from runoff and characterize current waste discharge volumes of the LBNL and wastewater treatment capacity at the East Bay Municipal Utility District's (EBMUD's) wastewater treatment plant, and evaluate whether the implementation of the 2004 LRDP would result in a violation of applicable standards or waste discharge requirements.		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	■	□

	Will be Analyzed in EIR	No Additional Analysis Required
LBNL does not use on-site groundwater nor does its steep terrain allow it to be an important site for groundwater recharge. Except for monitoring wells, there are no groundwater wells on-site or nearby that support existing or planned land uses. Groundwater is not a local supply source for Berkeley. Therefore, this topic will be briefly discussed in the LRDP EIR.		
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	■	□
Because Berkeley Lab is situated in an area of hills and canyons with multiple drainages, drainage control and maintenance has historically been an essential component of the Lab's existence. The 2004 LRDP likely would encourage siting of future projects in areas not affecting the major drainage patterns of the site. In cases where such siting is unavoidable, proper engineering would be employed to protect against erosion and siltation. Development under the 2004 LRDP could increase impervious surfaces and alter drainage patterns of building sites, which could result in increased runoff. The LRDP EIR will characterize site-wide drainage patterns and will evaluate the potential for flooding as a result of increased runoff under the proposed LRDP program		
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	■	□
LBNL's original stormwater drainage system was not initially designed for 100-year storm conditions, although subsequent improvements and expansion have been designed to that standard. Under extremely heavy rainfall, LBNL may contribute to off-site overloading downstream along Strawberry Creek. An LRDP-related increase of impervious surface area could add incrementally to this condition. Such an increase in impervious surface could increase the volume of surface water runoff and increase levels of urban contaminants in stormwater. The LRDP EIR will evaluate if the existing/planned drainage system could accommodate increased runoff generated as a result of development under the 2004 LRDP. The LRDP EIR will also evaluate potential impacts associated with stormwater pollution under the 2004 LRDP.		
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	■	□
See above. Such an increase in impervious surface could increase the volume of surface water. The LRDP EIR will evaluate if the existing/planned drainage system could accommodate increased runoff generated as a result of development under the 2004 LRDP. The LRDP EIR will also evaluate potential impacts associated with stormwater pollution under the 2004 LRDP. The proposed LRDP likely would encourage new on-site development for existing developed areas such that the need for new impervious surfaces would be minimized. Nonetheless, an increase of new impervious surface is expected to result from the proposed LRDP.		

	Will be Analyzed in EIR	No Additional Analysis Required
f) Otherwise substantially degrade water quality?	■	□
Various ways in which the 2004 LRDP could potentially affect water quality are discussed above. An additional mode of potential surface water quality degradation from LBNL is airborne deposition of radionuclides. Currently, Berkeley Lab emits very small quantities of various radionuclides resulting from laboratory use of these chemicals. Because they are airborne, these radionuclides can disperse and become deposited upon surface waters in the area. Extensive monitoring of LBNL radionuclides emission to date indicates that such deposition on surface waters is generally of such low levels as to be undetectable; this has resulted in a negligible effect to area water quality. Expansion of research activities under the LRDP could result in some increase of radionuclide use and resulting emissions. These potential emissions too are expected to have negligible effect on area water quality.		
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	□	■
The LBNL site is not within a 100-year flood hazard area nor would the proposed LRDP be directly involved in residential siting.		
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	□	■
See response to 8g, above.		
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	■	□
See response to 8g, above.		
j) Inundation by seiche, tsunami, or mudflow?	■	□
Neither seiche, tsunami, or mudflow are considered realistic risks to the LBNL site due to its elevation and proximity to surrounding geographic features.		
9. LAND USE AND PLANNING - Would the project:		
a) Physically divide an established community?	■	□
The LRDP would not expand or substantially change the LBNL site's borders. Surrounding communities would not be subject to physical division by potential LRDP projects.		

	Will be Analyzed in EIR	No Additional Analysis Required
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the LRDP, general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	■	□
The LBNL site is not subject to local or agency land use planning besides the University of California's approved LBNL LRDP.		
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	■	□
The LRDP would not affect any applicable habitat conservation plan or natural community conservation plans.		
10. MINERAL RESOURCES -- Would the project:		
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	□	■
The LBNL site does not include known mineral resources of regional value.		
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	□	■
The LBNL site does not include any locally-important mineral resource recovery sites.		
11. NOISE – Would the project result in:		
a) Exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies?	■	□
Increases in traffic, mechanical equipment associated with new structures, and increases in LBNL Hill site population could result in potential long-term increases in noise levels. Additionally, operation of construction equipment could result in substantial short-term noise increases that might include short-term, temporary exceedances of noise ordinances in nearby areas. The LRDP EIR will analyze the magnitude of these noise increases, and will evaluate whether the increased noise levels associated with implementation of the 2004 LRDP would exceed applicable standards.		

	Will be Analyzed in EIR	No Additional Analysis Required
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	■	☐
Because construction at LBNL generally does not include pile driving, LBNL activities do not generate excessive groundborne vibration or groundborne noise levels, particularly to off-site receptors. The LRDP EIR will address vibration and groundborne noise issues, as appropriate.		
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	■	☐
See above. Increases in on-site population and general operations under the 2004 LRDP could result in ambient noise-level increases. The LRDP EIR will evaluate whether the increased permanent noise levels would exceed applicable standards.		
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	■	☐
See above. Operation of construction or other equipment could result in substantial temporary or short-term noise increases. The LRDP EIR will use current noise modeling methods to predict the magnitude of these temporary noise increases, and will evaluate whether the increased temporary noise levels associated with implementation of the 2004 LRDP would exceed applicable standards.		
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	■
The LBNL site is neither within an airport land use plan nor within two miles of a public airport.		
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	■
The LBNL site is not within the vicinity of a private airstrip.		
12. POPULATION AND HOUSING -- Would the project:		
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	■	☐

	Will be Analyzed in EIR	No Additional Analysis Required
By raising the LBNL population ceiling by approximately 750, the proposed LRDP could increase the demand for housing near the Lab area. This demand would be dispersed over 20 years and, based on current commute patterns of Lab employees, over a broad area of the East Bay and beyond. While this would be an insignificant increase in demand relative to the overall number of houses in the region, cumulative growth over 20 years could cause an aggregate increase in demand versus a dwindling supply of available residences. Hence, the LRDP could contribute slightly to a cumulative housing impact. This will be analyzed in the LRDP EIR.		
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	■
The LBNL site does not include housing or long-term residential uses, and no housing would be displaced.		
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	■
The LBNL site does not include housing or long-term residential uses, and no housing would be displaced.		
13. PUBLIC SERVICES		
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:		
Fire protection?	■	☐
2004 LRDP-related increases in development and on-site personnel would increase the potential need for emergency fire services. LBNL's on-site fire response equipment, water storage or distribution, and fire department may be expanded as needed to address any increases in demand. The LRPD EIR will analyze impacts to both on- and off-site fire protection providers.		
Police protection?	■	☐
LRDP-related increases in development and on-site personnel would increase the potential need for police protection services. LBNL's on-site security forces likely would be expanded as needed to accommodate any increases in demand. The LRPD EIR will analyze impacts to both on- and off-site security and police protection providers.		
Schools?	■	☐

	Will be Analyzed in EIR	No Additional Analysis Required
LRDP-related increases in LBNL personnel could draw more families with school-aged children to the LBNL commute area. This would be a relatively small increase in demand for schools when dispersed over 20 years and a relatively wide geographic area. The LRPD EIR will analyze impacts to both on- and off-site security and police protection providers.		
Parks?	■	□
LRDP-related increases in LBNL personnel could draw more families into the area and thus increase demand for parks and recreational facilities. The LRPD EIR will analyze impacts to parks and recreational facilities, as appropriate.		
Other public facilities?	■	□
See response to 13a "Parks," above.		
14. RECREATION --		
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	■	□
2004 LRDP-related growth in on-site personnel might slightly increase demand for parks and recreational facilities throughout the region, but this increase would be imperceptible and would not be anticipated to substantially contribute to physical deterioration of facilities. The LRDP EIR will address this issue as appropriate.		
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	□	■
New or expanded recreational facilities are not expected to be a result, either direct or indirect, of the proposed project. The LRDP EIR will address this issue as appropriate.		
15. TRANSPORTATION/TRAFFIC -- Would the project:		
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	■	□

	Will be Analyzed in EIR	No Additional Analysis Required
Implementation of the proposed 2004 LRDP would increase the LBNL population and the number of on-site parking spaces, which could result in increased vehicular traffic on local streets and the adjacent regional highway system. The LRDP EIR will analyze the impact of additional LRDP-related and cumulative traffic on the local street networks, including intersection capacity, and the regional highway network, including the impact on the capacity of Congestion Management Program designated roadways and freeway ramps and adjacent segments.		
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	■	□
The EIR will analyze the impact of additional 2004 LRDP-related and cumulative traffic on the local street networks, including intersection capacity, the regional highway network, and including roads and highways designated by the Alameda County Congestion Management Agency.		
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	■	□
Implementation of the 2004 LRDP would not alter existing air traffic patterns.		
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? Create unsafe conditions for pedestrians or bicycles?	■	□
The 2004 LRDP is a general land use plan intended to guide the pattern of campus development and does not articulate specific projects or structures. The LRDP EIR will evaluate the potential for future changes to the campus circulation system or development of incompatible uses to increase hazards to traffic, pedestrians or bicyclists. It is expected that any design of new roads under the proposed LRDP would feature safety and compatibility with expected uses. All appropriate design guidelines, regulations and safety plans would be followed.		
e) Result in inadequate emergency access?	■	□
See response to 15d, above. The LRDP EIR will analyze impacts to emergency access and egress resulting from implementation of the 2004 LRDP.		
f) Result in inadequate parking capacity?	■	□
The 2004 LRDP will include parking policies and projections to be carried out under project implementation. The LRDP EIR will evaluate the adequacy of existing and proposed parking at Berkeley Lab. Where parking demand may not be met, measures will be identified to encourage or enhance use of alternative means or transportation, including car and van-pooling, and public transportation.		

	Will be Analyzed in EIR	No Additional Analysis Required
g) Conflict with applicable policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	■	□
See above. It is expected that the proposed LRDP would continue LBNL's policies of encouraging and accommodating alternative transportation. The proposed 2004 LRDP will describe alternative transportation modes and include policies to promote and expand their use; the LRDP EIR will analyze whether the implementation of the 2004 LRDP would conflict with applicable LRDP policies supporting alternative transportation.		
16. UTILITIES AND SERVICE SYSTEMS – Would the project:		
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	■	□
The East Bay Municipal Utility District operates a wastewater treatment plant that serves the Berkeley area. The 2004 LRDP EIR will characterize the capacity of the EBMUD plant and analyze the impact of projected increases due to development under the 2004 LRDP.		
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	■	□
With the exception of some process water treatment, water and wastewater treatment is conducted off-site by water and wastewater service providers. Growth under the 2004 LRDP could increase the quantity of wastewater discharged to wastewater treatment facilities. The LRDP EIR will evaluate the increased demand on wastewater treatment and conveyance facilities under the LRDP, and evaluate potential impacts associated with any new or expanded facilities, if any would be required to meet this demand.		
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	■	□
Development under the 2004 LRDP could increase impervious surfaces, which could increase the volume of stormwater drainage. The LRDP EIR will characterize sitewide drainage, will evaluate the increased demand for stormwater drainage facilities under the 2004 LRDP, and will evaluate potential impacts associated with any new or altered drainage facilities, if any would be required to meet this demand.		
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	■	□

	Will be Analyzed in EIR	No Additional Analysis Required
Implementation of the proposed 2004 LRDP would increase the amount of LBNL building space and population, which could result in an increase in water usage. The LRDP EIR will evaluate whether possible water demand increases would exceed available or planned entitlements or capacity; the environmental impacts of new, expanded, or altered facilities, if any are required to meet the increased demand, would also be evaluated in the EIR.		
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	■	☐
See above. The LRDP EIR will evaluate whether projected water demand increases associated with increased population would exceed available or planned entitlements or capacity. The LRDP EIR will also examine the environmental impacts of new, expanded, or altered facilities, if any are required to meet this increased demand.		
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	■	☐
LRDP-related on-site construction and personnel increases would be encouraged within existing developed areas, which may entail demolition of obsolete structures. This increased waste stream—from both increased operations and construction/demolition—would be partially offset by LBNL's aggressive approach to integrated recycling and reuse and overall solid waste stream reduction. Implementation of the proposed 2004 LRDP could result in an increase in LBNL's solid waste generation, including debris from construction activities. The LRDP EIR will evaluate whether existing landfill capacity is sufficient to accommodate growth under the 2004 LRDP.		
g) Comply with applicable federal, state, and local statutes and regulations related to solid waste?	■	☐
The LRDP EIR will evaluate the impact of implementation of the 2004 LRDP on Berkeley Lab compliance with applicable statutes and regulations related to solid waste.		
17. MANDATORY FINDINGS OF SIGNIFICANCE --		
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	■	☐

	Will be Analyzed in EIR	No Additional Analysis Required
As indicated above, implementation of the 2004 LRDP has the potential to result in significant impacts that could degrade the quality of the environment. The LRDP EIR will evaluate the potential for the 2004 LRDP to result in significant impacts that could degrade the quality of the environment, reduce habitat for a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.		
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	■	☐
UC Berkeley is preparing a new LRDP to accommodate a projected enrollment increase. The City of Berkeley has updated its general plan and anticipates new growth and development. Those programs, among other programs and projects, and the proposed growth under a new 2004 LRDP could contribute to a range of cumulative impacts in the area. The LRDP EIR will evaluate whether impacts associated with growth under the 2004 LRDP, in combination with past, current, and reasonably foreseeable future projects, have the potential to be cumulatively considerable.		
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	■	☐
As discussed in the checklist sections above, the proposed 2004 LRDP will have the potential to result in significant impacts. The LRDP EIR will evaluate if these impacts have the potential to result in substantial adverse effects on human beings, either directly or indirectly.		

18. Fish and Game Determination

Based on the information above, there is no evidence that the Project has a potential for a change that would adversely affect wildlife resources or the habitat upon which the wildlife depends. The presumption of adverse effect set forth in 14 CCR 753.5 (d) has been rebutted by substantial evidence.

☐ Yes (Certificate of Fee Exemption)

■ No (Pay fee)

BERKELEY LAB
One Cyclotron Road, MS 90K
Berkeley, California 94720

Ernest Orlando Lawrence
Berkeley National Laboratory

October 31, 2003

State of California
Office of Planning and Research
1400 Tenth Street
Sacramento, California 95814

ERRATA SHEET

For:

REVISED NOTICE OF PREPARATION
DRAFT ENVIRONMENTAL IMPACT REPORT

Project Title:	LBNL 2004 Long Range Development Plan
Project Location:	Lawrence Berkeley National Laboratory
County:	Alameda County, California
SCH#:	2000102046

On October 28, 2003, Lawrence Berkeley National Laboratory (LBNL) submitted to the State Clearinghouse a revised Notice of Preparation (NOP) for the above project. The NOP includes two numerical errors that overstate elements of the projected growth of LBNL under the proposed project. The following replacement text is provided to correct those errors or to otherwise clarify the text (text to be changed is underlined):

1. On Revised NOP page 7, the text currently reads:

This forecasted population would represent an increase of approximately 30% over the current LBNL population and approximately 25% over the 1987 LRDP population projection of 4,750.

This text is hereby amended to read:

This forecasted population would represent an increase of approximately 28% over the current LBNL population and approximately 16% over the 1987 LRDP population projection of 4,750.

2. On Revised NOP page 8, the text currently reads:

Implementation of the 2004 LRDP would increase the Lab's main Hill site total building area to 2,980,000 gsf.

This text is hereby amended to read:

Implementation of the 2004 LRDP would increase the Lab's main Hill site total building area to approximately 2,560,000 gsf.

LBNL appreciates your interest in this project and welcomes your comments on the NOP by November 26, 2003 to:

Jeff Philliber
Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90K
Berkeley, CA 94720

Or by e-mail to: LRDP-EIR@lbl.gov

Sincerely,

Laura Chen, Chief
LBNL Facilities Planning

Responses to Notice of Preparation and Transcript of November 17, 2003, Scoping Meeting

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
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Flex your power!
Be energy efficient!

December 1, 2003

ALA013063
ALA-013-12.24
SCH2000102046

Mr. Jeff Philliber
Lawrence Berkeley National Laboratory
1 Cyclotron, MS 90K
Berkeley, CA 94720

Dear Mr. Philliber:

2004 LONG RANGE DEVELOPMENT PLAN – NOTICE OF PREPARATION

Thank you for including the California Department of Transportation (Department) in the early stages of the environmental review process for the 2004 Long Range Development Plan. The following comments are based on the Notice of Preparation.

Traffic Analysis
Please include the information detailed below in the Traffic Study to ensure that project-related impacts to State roadway facilities are thoroughly assessed. We encourage the University to coordinate preparation of the study with our office, and we would appreciate the opportunity to review the scope of work. The Department's *"Guide for the Preparation of Traffic Impact Studies"* should be reviewed prior to initiating any traffic analysis for the project; it is available at the following website:
http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

The Traffic Study should include:

1. Site plan clearly showing project access in relation to nearby state roadways. Ingress and egress for all project components should be clearly identified.

2. Project-related trip generation, distribution, and assignment. The assumptions and methodologies used to develop this information should be detailed in the study, and should be supported with appropriate documentation.

3. Average Daily Traffic, AM and PM peak hour volumes and levels of service (LOS) on all significantly affected roadways, including crossroads and controlled intersections for existing, existing plus project, cumulative and cumulative plus project scenarios. Calculation of cumulative traffic volumes should consider all traffic-generating developments, both existing and future, that would affect study area roadways and

intersections. *The analysis should clearly identify the project's contribution to area traffic and degradation to existing and cumulative levels of service. Lastly, the Department's LOS threshold, which is the transition between LOS C and D, and is explained in detail in the Guide for Traffic Studies, should be applied to all state facilities.*

4. Schematic illustration of traffic conditions including the project site and study area roadways, trip distribution percentages and volumes as well as intersection geometrics, i.e., lane configurations, for the scenarios described above.

5. The project site building potential as identified in the General Plan. The project's consistency with both the Circulation Element of the General Plan and the Alameda County Congestion Management Agency's Congestion Management Plan should be evaluated.

6. *Mitigation should be identified for any roadway mainline section or intersection with insufficient capacity to maintain an acceptable LOS with the addition of project-related and/or cumulative traffic.* The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should also be fully discussed for all proposed mitigation measures.

7. Special attention should be given to the following trip-reducing measures:
   - Coordinating with AC Transit and BART to increase transit/rail use by expanding routes and emphasizing express service to regional rail stations, and by providing bus shelters with seating at any future bus pullouts,
   - Providing transit information to all future project employees, and
   - Encouraging bicycle- and pedestrian-friendly design.

While the 2000 Highway Capacity Manual (HCM) may not be the preferred level of service methodology, it should be used for analyzing impacts to state facilities, particularly where previous analysis employing alternative methodologies has identified impacts. The residual level of service, assuming mitigation has been implemented, should also be analyzed with HCM 2000.

Please forward a copy of the 2004 Long Range Development Plan, along with the Traffic Study and Technical Appendices, the environmental document and staff report to the address below as soon as they are available.

Patricia Maurice, Associate Transportation Planner
Office of Transit and Community Planning, Mail Station 10D
California DOT, District 4
111 Grand Avenue
Oakland, CA 94612-3717

Please feel free to call or email Patricia Maurice of my staff at (510) 622-1644 or patricia_maurice@dot.ca.gov with any questions regarding this letter.

Sincerely,

TIMOTHY C. SABLE
District Branch Chief
IGR/CEQA

c: Mr. Scott Morgan, State Clearinghouse

Office of the City Manager

November 26, 2003

Jeff Philliber
Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90K
Berkeley, CA 94720

Re: Revised Notice of Preparation of Draft Environmental Impact Report:
LBNL 2004 Long Range Development Plan

Dear Mr. Philliber:

This letter is the City of Berkeley's response to the Berkeley Lab's Revised Notice of Preparation ("NOP"), referenced above.

The City of Berkeley appreciates this opportunity to identify issues it believes should be analyzed in the Long Range Development Plan ("LRDP") environmental impact report ("EIR"). It submits these comments in the hope that they will help the Berkeley Lab design and carry out an environmental review process under the California Environmental Quality Act (CEQA) that identifies all relevant significant impacts, identifies and considers the full range of mitigation measures and a reasonable range of appropriate alternatives, and ensures that all mitigations are implemented and carefully monitored over the life of the LRDP.

The following comments on the Notice of Preparation are submitted in that spirit.

As we see it, the first step in the process is for the City to provide a full statement of its concerns and the issues it believes must be addressed in the LRDP EIR. We would be happy to meet with Berkeley Lab staff (and/or consultants) to elaborate on these comments or provide additional information, to the extent it is available. The next step would be for the City and the Berkeley Lab to agree (if possible) on specific alternatives and measures to be included in the draft EIR before it is released for review and comment. As the Berkeley Lab is aware, once a draft EIR is released for public review, it is much more difficult, both legally and practically, to add significant analyses to it, because of the risk that such analyses will trigger recirculation. We have therefore included in this letter proposed alternatives and mitigation measures we believe should be included in the draft EIR, and invite the Berkeley Lab to discuss these with City staff. In proposing mitigation measures, we have been careful to limit ourselves to measures the City would actually be likely to undertake; for instance, we have not suggested significantly widening

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existing roads serving the Laboratory and its adjoining neighborhoods. Thus, this letter represents the City's formal statement of its willingness to work closely with the Berkeley Lab, through the environmental review process or otherwise, to devise an implementation plan and schedule for each proposed mitigation measure involving the City.

With respect to mitigation of impacts, we urge the Berkeley Lab to consider an approach the City recently used with Alta Bates Summit Medical Center. We recently recommended that UC Berkeley also employ this approach when formulating measures to mitigate the impacts of the proposed 2020 LRDP for the campus. Instead of devising specific actions for reducing predicted impacts, this alternative method requires the adoption of performance standards that the project sponsor commits to achieving over the long term. Both approaches require the EIR to analyze the likelihood and severity of specific impacts. But instead of relying on specific mitigation measures of uncertain feasibility and efficacy, the City's approach would require the Berkeley Lab to (1) state clearly the level of impacts it expects to result from the LRDP, (2) commit to ongoing monitoring, and (3) employ whatever mitigation measures are necessary at the time the acceptable impact level is exceeded, to reduce the impact to the level specified in the EIR. The benefits of this approach are that it does not rely on (necessarily inaccurate) predictions about impacts and mitigations 15 or 20 years hence. The City recognizes that this approach may not be appropriate for all types of impacts, but it is appropriate for operational impacts such as traffic, parking, noise, sewage collection, as well as measurable impacts on environmental conditions such as air and water quality.

Finally, we believe that the adequacy of the EIR will depend on the use of valid information about existing conditions and trends in the City and the affected area. In particular, the Berkeley Lab will need to obtain a significant amount of information concerning permitted and projected land uses (other than Berkeley Lab projects), infrastructure, and numerous other matters, from the City. Because of the range and complexity of the information required, the information gathering process could become burdensome for the Berkeley Lab. Accordingly, to facilitate this process and ensure that the information provided is valid, I have assigned Grace Maguire[1] to be the single point of contact for the Berkeley Lab for all information needs related to preparation of the EIR.

General Comments

We are disappointed to find that the NOP fails to explain why the LBNL is preparing a separate LRDP. An information sheet titled Berkeley Lab Long Range Development Plan (November 2003) states that the University of California, "not its Berkeley campus," manages the Lab under contract with the U.S. Department of Energy. This material describes the Lab and UC Berkeley as "neighbors" both residing on land owned by the Regents of the University of California. As the State agency governing both the Lab and the Berkeley campus, it is, however, the Board of Regents, not the UC Berkeley Campus or the Berkeley Lab, that is responsible for adopting both Long Range Development Plans.

[1] Ms. Maguire can be reached at gmaguire@ci.berkeley.ca.us or 981- 7008.

Moreover, given that the Berkeley Lab is a U.S. Department of Energy Facility, it is puzzling that the NOP makes no mention of any applicable requirements of the National Environmental Policy Act (42 U.S.C. Sec. 4321 et. seq.). CEQA provides for coordinated review when a project is subject to both Federal and State environmental review requirements. The NOP should, at a minimum, describe the circumstances under which projects being carried out under the Lab's LRDP will be subject to review under NEPA.

Please provide an opportunity for additional comment on a more detailed Project Description prior to release of the DEIR**.** The lack of detail in the description of the Long Range Development Plan makes it extremely difficult to make recommendations regarding the scope of CEQA analysis. The Project Description provided in the NOP (pp. 6-7) consists of three brief paragraphs including ten bullet points that supposedly set forth the LRDP's primary objectives. Except for the objective regarding relocation of off-site and UCB research activities to the main Hill site, the project description and objectives are neither quantified nor location specific.
The NOP is similarly vague about the physical characteristics of future development. The document does not even identify the locations of the three major areas that define development intensity. (NOP, pp. 8-9.) Yet the locations and boundaries of these areas is key to analyzing most of the environmental impacts of the LRDP.

Please provide more detailed information when the LRDP alternatives are more developed, and offer an opportunity for additional comment before release of the draft EIR. Also, please explain the sequence and timing of major project milestones. The NOP does not make clear when an LRDP Project Description with enough detail to allow analysis of environmental impacts will be made public.

The EIR should establish a standard methodology and terminology for measuring the additional population resulting from Berkeley Lab projects. It appears from the NOP that the Berkeley Lab intends to count actual persons traveling to and from the site for purposes of traffic impacts. This is a good approach, which should be followed consistently.

A valid methodology and consistent terminology is especially critical in this EIR, because the LRDP does not propose specific construction projects, but overall population and square footage caps. Accordingly, the program analysis in the EIR will rely largely on a generic analysis of the impacts of numbers of people or square feet of building, rather than a specific number of people in specific buildings. Yet environmental documents on future projects will tier off this EIR. (NOP, p. 11.) Thus for the program analysis of the EIR to be meaningful, it must be commensurable with future project-specific analyses. For this reason the EIR must establish consistent methodology and terminology that will be used throughout the LRDP period.

According to the Notice of Preparation, the LRDP will guide future development of the Berkeley Lab. (NOP, pp. 3, 6-7.) The NOP also states that the LRDP will not be an implementation plan and will not constitute a commitment to any specific development projects, construction schedules, or funding priorities. To what extent will agencies and the public be able to rely on the LRDP as an indication of the type, intensity, and location of LBNL future growth and development? The EIR must describe how the LRDP will be used. For instance, will it be a general guideline from which the Berkeley Lab may vary more or less at will, or will it be more comparable to binding regulations? Presumably, the correct answer is somewhere in between. How closely the Berkeley Lab will comply with the LRDP will also significantly affect the degree to which agencies and the public can rely on the EIR as a predictive document.[2]

The Berkeley Lab states that it is exempt from local land use plans and regulations. Although this may be true, it does not necessarily exempt the Berkeley Lab from analyzing its conformance or lack thereof with local policies under CEQA. Given the potential impacts the Berkeley Lab's LRDP may have on the City's ability to implement its General Plan and other relevant local land use policies, it is essential that the Berkeley Lab consider these impacts in its deliberations on the LRDP, regardless of whether it is subject to local land use plans and regulations. Local plans and regulations are in place for the health, safety and welfare of the community and for its orderly and rational development. They reflect the community's articulation of its perception of the general welfare. Moreover, Berkeley's General Plan and land use regulations will determine the type and intensity of development that surrounds the Lab. In order to adequately assess the impacts of the LRDP it is essential to understand the setting within which the LRDP will be carried out. For these reasons the Berkeley Lab's development plans must be analyzed in terms of the City's plans in order to accomplish the basic purposes of CEQA. To neglect this analysis would be to neglect significant environmental issues that are appropriately addressed in a program-level EIR.[3]

Finally, we urge the Berkeley Lab to allow 60 days for public review of the draft EIR, and to release the final EIR well before the Regents are scheduled to act on the LRDP. In the past, final EIRs on a number of projects have been released to the public and interested agencies only a very few days before the Regents were scheduled to (and did) act. While we acknowledge that CEQA does not require any particular period for public review of final EIRs, it seems unnecessary and contrary to the spirit of informed self-government to schedule the release of the final EIR in a manner that effectively denies citizens and other agencies the opportunity to communicate their concerns. This is especially so when the key issues relate to proposed mitigation programs.

Our specific section-by-section comments follow.

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[2] Related to this, the project objectives in the EIR should be meaningful and correspond with the policies and goals of the LRDP. This will help other agencies and the public evaluate the Berkeley Lab's compliance with the LRDP and the LRDP EIR over time. The ability to do so is particularly important given the LRDP's reliance on population and square footage caps.

[3] Moreover, if development under the LRDP will not conform to the City's land use regulations, the Berkeley Lab's reliance on the City's General Plan EIR is suspect, since that EIR assumes development consistent with the General Plan.

Project Description

The project objectives (NOP, pp. 6-7) are so general that they do not relate in any discernable way to the LRDP. Thus, to the reviewer, the proposed increases in average daily population (ADP) and gross square feet (GSF) appear entirely arbitrary and without justification. In order to allow meaningful review (by the Regents as well as the public) the EIR must clearly relate the project objectives to the proposed increases in ADP and GSF. The DEIR needs to provide some indication of the factors that drive these projections. Why, for example, does LBNL anticipate that the "adjusted daily population" at the Hill site will grow from 4,300 to 5,500, an increase of approximately 28 percent over the current population and approximately 16 percent over the population projections in the 1987 LRDP? Is this figure related to projected increases in UC enrollment, population growth in the Bay area, or anticipated increases in Federal government research activities?

From an environmental standpoint the even more important question that the EIR must answer is why the Board of Regents should authorize development of up to 800,000 gross square feet of new development in one of the most difficult-to-develop areas of Berkeley given the associated unavoidable environmental impacts. Among the most significant of these effects will be the effect of exposing up to 1,200 more individuals to the safety hazards presented by a steep and inaccessible site that is particularly susceptible to wildland fires and significant seismic hazards due to its steep slopes, geological conditions, and location within 300 feet of the Hayward Fault.

Population Growth and Space Needs Projections

The EIR needs to explain how and why the identified project objectives translate into more space per employees/guests, in one of the steepest and most inaccessible parts of Berkeley. There is nothing in the NOP that indicates that the Berkeley Lab is currently overcrowded. The current ratio of 409 square feet per person seems remarkably generous especially in light of a statement in the recent Building 49 DEIR that the LBNL target goal is 135 net square feet per person. (Building 49 Project DEIR, p. III-5).

According to Table 1 (NOP, p. 8), the ratio of on-hill built space (GSF) to ADP is expected to increase to 465 by 2025, again derived from the same table. Thus while ADP is projected to increase by 28 percent, on-hill space is projected to increase by 45 percent, and the ratio between the two increases 14 percent.

The discussion of growth and space needs projections is also confusing because the NOP appears to use some key terminology inconsistently. On page 4, the NOP states that the Berkeley Lab occupies approximately 400,000 GSF off of the Hill site, including 100,000 GSF on UC-owned land on the U.C. Berkeley campus and 295,000 gsf of commercial/industrial lease space elsewhere in Berkeley and at other locations. On page 6, however, the NOP states that the 100,000 gsf of "off-hill" space is "non-UC-owned land". Table 1 (NOP. p. 8) also refers to

100,000 gsf of existing “Off-Hill space at UCB” but specifically excludes “off-site lease space, which will change as needs and/or market conditions allow.”
It is essential that the EIR use consistent terminology when describing existing and projected conditions and alternatives.

The EIR should include a clear definition of how “average daily population” is calculated and information regarding a potential maximum daily population that can be expected and how often such a maximum may be achieved over the course of a year. The EIR should describe how the ADP is divided among various categories of workers and visitors, including researchers, administration, visiting scholars, etc. As discussed further below, the ADP should identify any workers who are likely to overlap with campus researchers and visitors.

The NOP (p. 8) states that although the Berkeley Lab does not expect to increase space at the U.C. Berkeley campus, the mix of uses in that space may change. The EIR should discuss the relative impacts (population, traffic, parking, etc.) of different mixes of uses. Moreover, the EIR needs to include specific information describing the nature and location of off-site (i.e. space that is not on the UC Campus) because of the potential effects of such uses on public facilities and services provided by the City of Berkeley. The NOP indicates that the Lab currently occupies about 295,000 square feet of commercial/industrial lease space in Berkeley, Oakland, Walnut Creek, and Washington, D.C. (NOP, p. 4-5) The EIR should discuss the likely amount and location of “off-site lease space” (NOP, p. 8), and the number of employees associated with that space. While the amount of such space may well fluctuate over time, the EIR must still give at least a reasonable worst-case estimate of the amount of space needed and the impacts associated with its use. In any event, the EIR should discuss the likely location of such space.

We note that the 1987 LRDP includes specific information regarding a number of off-site activities including warehousing and receiving support functions occupying 61,000 gsf and 28,000 gsf of space in Emeryville and Berkeley, respectively, and LBL's Printing Plant, which was relocated to 4500 gsf of space in an industrial park in West Berkeley in 1979 as a near-term solution to a space shortage. The 1987 LRDP also described facilities at UCB's Richmond Field Station (RFS) being used for the Earth Science Division's research programs in waste isolation and the Applied Science Division's indoor environment program. The EIR for the 2004 LRDP should update and augment this information as needed.

The 1987 LRDP also states that the Laboratory provides research facilities for more than 200 UC Berkeley faculty and approximately 600 graduate students who work in facilities including the Light Source, Bevalac, SuperHILAC, 88-Inch Cyclotron, and National Center for Electron Microscopy. If these figures are still accurate, these faculty and students represent close to 20 percent of the 4,300 average daily population identified in the NOP (Table 1). What proportion of the projected ADP do you expect will be UC faculty and students? The EIR should discuss this relationship under Cumulative Impacts.

Land Use

The CEQA Guidelines require the NOP to "provide the responsible agencies with sufficient information describing the project and the potential environmental effects to enable the Responsible Agencies to make a meaningful response." (14 Cal. Code Regs. 15082, (a) (1).) This information must include the location of the project. At a minimum, the NOP should have identified the location and boundaries of the three "areas" mentioned on pages 8 and 9.

The proposed Land Use Plan with its three Land Use categories is apparently central to the proposed LRDP, but the nature and intended use of this Plan is not at all clear. There is no map showing the location of the Land Use Categories and the total acreage in each category (even if approximate at this stage) is not stated. This is a major inadequacy of the NOP that makes it very difficult to respond with relevant comment.

In particular, more information is needed to understand the description of the Facilities Development Area (NOP page 8). The NOP indicates the "Final building locations and massing would not be dictated by the land use plan but would be the result of a comprehensive planning process." If the land use plan does not include objectives, policies, and standards that dictate the nature and location of development, what is its purpose? More importantly, what is the process by which these decisions will be made? What is the comprehensive planning process that the NOP says will identify all the final building locations and massing within the Facilities Development Area? What would the scope of this "comprehensive planning process" include? Based on this brief description, it appears that the intent is to plan and evaluate future development incrementally. This piecemeal approach seems contrary to the intent of preparing a Long Range Development and to CEQA's intent and requirements and would make it impossible to adequately assess the potential impacts of future development at this sensitive site.

As described, the Land Use Plan does not seem to address the relationship between LBNL operations and the neighboring lands. Because of the site's location on the edge of Berkeley's developed area, conveyance of people and material to and from the site is a primary concern of the City of Berkeley. This subject should be thoroughly covered within the scope of the LRDP and the EIR.

We also note that approximately 66 acres of Regents'-owned land formerly managed by UC Berkeley for vegetation and fire management purposes have been added to LBNL's management area (NOP, p. 9). Does the UC Berkeley LRDP use the same definitions for its land use designations? If not, what potentially significant environmental impacts might be associated with this transfer? Who is responsible for authorizing such transfers? Such actions raise additional questions about the appropriateness of the decision to separately prepare and assess the environmental impacts of the LRDPs for the Berkeley Lab and the UC Berkeley campus.

Proposed Major Planning Policies

As explained above, because the NOP fails to explain how and why the identified project objectives translate into specific development objectives, especially in light of the site's physical characteristics, the relationship between the Lab's mission, the population and space needs, and the proposed major planning policies is completely unclear. Underlying all of the proposed major policies is the unstated and possibly unsupportable premise that there should be more development on the main Hill site. Because this premise appears to be the basic policy driving the LRDP, we are puzzled by its omission from the statement of major planning policies.

If the LRDP is formulated to implement a policy that provides for continued development of the Hill site regardless of the unavoidable significant environmental impacts, the Board of Regents will have to adopt a statement of overriding considerations. Such a decision would, however, require the Board of Regents to find that there is no feasible alternative to continued development of the Hill site. We find nothing in the NOP to support such a conclusion.

Under the sub-title Environmental Character, the NOP (p. 9) identifies a draft policy "to integrate natural and man-made environments." Integrate means "to join into a whole or unite." This may be interpreted as making the man-made environment more like the natural, and the natural environments more like the man-made. This is very different from the more typical goal, to strive for compatible relationships between natural and man-made environments, respecting the unique values and character of each. The meaning of the NOP in using the word "integrate" is confusing.

In addition to previously mentioned concerns regarding the basis for the population and space needs identified above, we have questions regarding some of the other draft policies for Growth and Development. What is the meaning of the policy "Balance approach to new development?" What is to be balanced? More information is also needed regarding "Promote opportunities for third-party development." This statement suggests that LBNL has a strategic plan, parallel to the UC Academic Strategic Plan, that foresees a significant role for third-party developers. If the LRDP is "informed" by other LBNL guiding documents, please reference those documents. Please clarify what "Third Party Development" means in this context.

Construction Program

The NOP (p. 11) indicates the EIR will analyze construction as an on-going activity based upon expected annual averages. The City appreciates the intention to address the combined impacts of ongoing construction under the LRDP. However, if the effects of simultaneous construction projects result in greater-than-average impacts, the EIR must address how these impacts will be mitigated over and above the mitigation needed for an "average" year.

Alternatives

The NOP lists and provides a very brief description of five "likely" alternatives stating that the final list of alternatives will be developed in conjunction with the environmental analyses. Without a clearly written statement of objectives, however, it will be impossible to select or evaluate a range of reasonable alternatives that could feasibly accomplish most of the basic objectives of the project while avoiding or substantially reducing one or more of its significant effects.

The NOP fails to disclose the University's preliminary thinking about which impacts are likely to be the most severe. In an inexplicable departure from the format of most Environmental Initial Studies, the Initial Study for the LBNL LRDP only identifies which potential effects will be analyzed in the EIR. It fails to indicate which are the most likely to be amenable to avoidance or mitigation by alternatives. Under the section regarding Mandatory Findings of Significance, the NOP does acknowledge that implementation of the 2004 LRDP has the potential to result in sufficiently significant impacts on the environment to warrant the mandatory determination. The Initial Study provides few clues, however, regarding the specific project details or specific impacts that lead to this conclusion.

The NOP's brief description of alternatives does not explain the thinking behind the choice of alternatives. Given the very general description of project objectives, it is impossible for a reviewer to determine whether the range of alternatives is reasonable. More importantly, it is questionable how LBNL can formulate alternatives without explaining the Laboratory's approach to evaluating the feasibility of alternatives (i.e., why some are considered reasonable enough to be included in the EIR and why others are apparently not). We raise this important issue because, as we have noted above, it is quite difficult to supplement an EIR's analysis of alternatives in any meaningful way once the draft EIR is released for public comment.

We appreciate the inclusion of a Reduced or No New On-site Parking alternative but question the rationale for a Reduced On-Site Population Growth alternative as described. CEQA requires an EIR to describe a range of alternatives that would feasibly attain most of the basic objectives of the project but avoid or substantially lessen any of its significant effects. (CEQA Guidelines, Section 15126.6) Given that many of the project's potentially significant impacts are associated with the physical characteristics of the site, it is unclear how this alternative would avoid or substantially lessen the project's significant effects. Moreover, even though we question the basis for the population growth projections set forth in the NOP, the rationale for an alternative that increases building space up to 800,000 gsf without any attendant increase in population is at best questionable.

Finally, we note that the NOP for the UC LRDP EIR proposes an alternative called "Increased Research in Hill Campus." The UC NOP briefly describes this alternative as "Growth in enrollment and research as estimated, but with a greater percentage of future research growth accommodated in the Hill Campus than assumed in the 2020 LRDP." Given that the description of possible alternatives in the UC NOP is similarly unspecific, it is impossible to ascertain whether this alternative is at all relevant to the LBNL's long-range plans.

Initial Study

As a threshold matter, the "initial study" form used in the NOP appears inconsistent with State requirements and obscures more than it discloses. CEQA Guidelines Section 15063 makes clear that the purpose of an initial study is "to determine if the project may have a significant effect on the environment" and, if an EIR is required, to assist the preparation of the EIR by "[f]ocusing the EIR on the effects determined to be significant. The Guidelines specifically require an initial study to include "an identification of environmental effects" and "discussion of ways to mitigate the significant effects identified, if any". (Section 15063(d))

The NOP for the LBNL LRDP employs a form that fails to specify which environmental impacts are potentially significant and includes no information regarding ways to mitigate such impacts. We can infer that the Berkeley Lab believes that the impacts listed under the "No Additional Analysis Required" column have no potential to be significant. However the "Will Be Analyzed in EIR" column includes impacts that obviously may be significant (e.g., transportation/traffic) as well as impacts that the narrative suggests are trivial (e.g., some public services, recreation).[4] This does not provide the interested public with enough information to submit complete comments with respect to the scope of the EIR or to suggest appropriate mitigation measures.

The following sections of this letter address specific topic areas in the "initial study".

Aesthetics

The NOP identifies a few of the locations from which project-related development "may be noticeable". The EIR needs to consider the effect of proposed development on the specific view corridors identified in the City's General Plan and associated documents.

The Initial Study states that due to distance, elevation, intervening terrain and vegetation, new development would not be expected to be highly visible from most off-site viewpoints. The LBNL site is very visible from many parts of Berkeley, and especially from the local freeways, due to its location high on the Berkeley hills. Many of the existing buildings are highly visible. It is hard to imagine that new buildings will not also be highly visible. The EIR should thoroughly analyze the impact that up to 800,000 square feet of new development could have on the existing visual character of the site, its visual quality and its surroundings.

The Initial Study states that the LRDP would "likely" include aesthetic design guidelines to be incorporated into any development projects. If such guidelines are intended to mitigate potentially significant effects on scenic vistas and the visual character of the Berkeley hills, the design principles, objectives, and review criteria should be set forth in the LRDP. The EIR must assess the impacts of those guidelines, including simulations of the effect of their application. Without such specific information it will not be possible to determine whether the guidelines would, in fact, be sufficient to mitigate the project's significant aesthetic impacts.

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4 As another example, the "Initial Study" states that possible flood hazards do not require further analysis in the EIR because the site is not within a flood hazard area (Checklist, p. 13, 8.g & 8.h), but then states that the EIR will analyze risks from flooding and inundation, for the same reason. (Id., 8.i & 8.j.) This is confusing and not informative.

Finally, because of the lack of specificity regarding the location of possible development, it is unclear whether the LRDP could adversely affect Strawberry Canyon, an open space resource that has habitat value and that is an important scenic resource for both Berkeley and Oakland residents. At its meeting of November 25, 2003, the Berkeley City Council approved a recommendation requesting the LBNL to protect and preserve the Hill site as an open space resource by emphasizing infill development and by not increasing the ratio of developed land per employee without an explicit finding that such an increase is justified. (See attached recommendation.)

Air Quality

While the NOP recognizes that the Bay Area is designated as a non-attainment zone with respect to certain particulate matter (PM3) and ozone levels, it does not indicate how it will address the problem given that the Bay Area Air Quality Management District does not have adequate air pollution data for Berkeley. We suggest that the following be considered in the EIR's analysis of environmental impacts due to traffic:

- Ambient data in areas of heavy development to be measured in advance of project development. In this manner, the University can determine whether impacts will exceed significance standards;
- Cumulative impacts of traffic on air quality
- Detailed information on number of proposed and current zero or near zero emission vehicles.

According to the Building 49 Project DEIR, approximately 2,170 truck loads would be needed to transport the approximately 26,000 cubic yards of soil that 65,000 square foot project would generate. An LRDP that proposes up to 800,000 square feet of new construction could conceivably generate more than 12 times the amount of excavation and require almost 27,000 truck loads during the time period covered by the plan. The DEIR needs to consider the significant effect that this level of construction could have on air quality and propose alternatives and mitigation measures to deal with this impact.

Biological Resources

The EIR should address impacts on biological resources in a comprehensive manner. Incremental elimination or degradation of the unique habitats of the upper Berkeley hills should be addressed as a potential cumulative impact in the EIR. Potential mitigation of impacts should consider establishing a Habitat Conservation Plan, Natural Communities Conservation Plan, or other more comprehensive approach to mitigation, if such mechanisms are warranted to achieve appropriate levels of protection

As discussed elsewhere, although the Laboratory is not necessarily subject to City of Berkeley ordinances, the EIR should evaluate the project's conformance with local ordinances. For example, the City of Berkeley currently prohibits removal of oak trees over a minimum size.

The EIR should classify any impacts that exceed the thresholds or standards specified in these ordinances as potentially significant.
The NOP states that no “blue-line streams” exist on the site (NOP, p. 5). However the area does include several creeks subject to protection under the City’s creek ordinance. (BMC Chapter 17.08. The EIR should analyze the consistency of development anticipated under the LRDP with the City’s ordinance.

Finally, it seems anomalous that “lands currently designated as “Ecological Study Area” would be designated “managed areas” instead of a “Special Habitat Protection Area”. (NOP, p. 9.) The EIR should disclose the impacts of treating the Ecological Study Area in this manner, as well as the alternative of treating it as a Special Habitat Protection Area.

Geology, Seismicity and Soils

Additional population (both daytime and resident) in proximity to the Hayward Fault and the wildlands of the East Bay Hills pose increased exposure of people and property to seismic and geological hazards. These issues are identified in the NOP. The City emphasizes that mitigation should describe how the Berkeley Lab intends to assist the City in providing the services and infrastructure needed to reduce hazard exposure to a less-than-significant level and to be able to respond adequately in the event of geologic hazard event. The NOP fails to mention that large portions of the project area are not only within the Alquist-Priolo Fault Rupture Hazard Zone for the Hayward Fault, but are also within areas that the State has designated as a Seismic Hazard Zone for earthquake-induced landslides as shown on maps issued in February 2003 under the State Seismic Hazards Act. The Building 49 Project EIR states that fault investigations have identified two active traces of the Hayward Fault in the area of that project. (Building 49 DEIR, p. IV.E-15)

The unique character of the seismic and other geologic hazards in the Berkeley area warrants special consideration. The Berkeley Lab site is exposed to a level of seismic, geologic and fire hazards characterized by experts as California’s most vulnerable in an urban area. Mitigating this type of risk through performance-based construction and risk-sensitive land use would lessen the threat to people and facilities on site and in the immediate environs. The EIR should evaluate such mitigation measures. As noted below, because of the heightened risk associated with the site’s physical condition, the EIR also needs to discuss coordination with the City ‘s evacuation and emergency response systems.

Hazards and Hazardous Materials

The City of Berkeley’s Toxics Management Division (TMD) is the Certified Unified Program Agency (Chapter 6.11, Division 20, Cal. HSC). At this time, the TMD has no outstanding issues with the operations of the facility regarding CUPA activities. We expect that LBNL will continue to implement all aspects of the City’s hazardous materials and hazardous waste laws, even those codes that are more restrictive than state codes, as allowed in the State HSC. In addition, our understanding is that the San Francisco Bay Regional Water Quality Control Board (RWQCB) for surface and subsurface water quality issues will regulate LBL.

The Department of Toxic Substances Control (DTSC) will continue to require any soils clean-ups under their authority. We have some concerns, however, regarding potential conflict with the standards for soils and groundwater clean-up that may be required by DTSC or RWQCB. Should the Department of Energy (DoE) reduce its budget for clean-up at LBNL, the facility will not meet any restrictive clean up goals. Mitigation measures should be expressed as measures required to comply with the most restrictive applicable standards to ensure implementation of such requirements regardless of changes in Federal funding for remediation.

It is essential that the DEIR not only assess the impact of development on the Hill site but also the potentially significant environmental effects of activities that take place within the facility. At its meeting of November 25, 2003, the Berkeley City Council approved a recommendation requesting the LBNL to analyze and mitigate the environmental and health effects of nano-science research activities undertaken at the Berkeley Lab site as follows: (The complete Council item is attached as Attachment 1.)

1. The EIR should review the potential environmental and health impacts of research activities that are carried out at the LBNL site in the sub-fields of nano-science:
2. Before being allowed to proceed, all nano-science and technology research projects at LBNL should undergo an independent evaluation process to assess health and safety impacts. This evaluation should be conducted by an independent Health and Safety Review Committee of knowledgeable experts approved by the City of Berkeley.
3. The LBNL shall provide to the City and to the public in a timely fashion the results of the initial startup health and safety and environmental reviews of all proposed nano-science research projects including those to be conducted at the Molecular Foundry as well as annual health and safety reviews of all continuing research projects.
4. The LBNL shall help to facilitate an independent bi-annual health and safety review by the Health and Safety Review Committee of all nano-science research being conducted at the LBNL.

A mitigation measure based on the pre-cautionary principle would require the LBNL to demonstrate that any research activity undertaken by LBNL will not have a detrimental effect on human health or the natural environment. Please provide information, as well, about projected increases in animal experimentation and animal experimentation facilities for LBNL.

As noted above, the proposed increase in population at the Hill site will expose structures and people a variety of fire and seismic-related hazards. Mitigation of these impacts will require close coordination the City's evacuation and emergency response planning efforts including measures to improve emergency access to and from this part of the Berkeley Hills. Because LBNL has few points of egress, any evacuation that may be required could significantly affect the City's ability to respond in the event of an emergency.

Hydrology and Water Quality

The LBNL is located in the Blackberry and Strawberry Canyon drainage areas of the Strawberry Creek watershed, including about a dozen tributary creeks. As noted in the Building 49 Project EIR, within the LBNL, the potential sources of storm water pollutants include chemicals used in scientific experiments and industrial support operations. Increased pollutants would also result from any increase in the number of vehicles on the site, especially as a result of drainage from access roads and parking areas.

Surface flows from are discharged into San Francisco Bay after flowing through the City but impacts on water quality in Strawberry Creek could also affect City property downstream, such as parks. While the Regional Water Quality Control Board enforces water quality standards, development near creeks may also be subject to regulation by the U.S. Army Corps of Engineers and/or the State Department of Fish and Game.

Mitigation measures should be crafted to ensure that there will be no impact on water quality in Strawberry Creek. Given the lack of specificity regarding the location of projects, the most appropriate form of mitigation may be a comprehensive management plan for the Strawberry Creek watershed that includes measures to maintain or improve water quality. At its meeting of November 25, 2003, the City Council adopted a recommendation requesting that the LRDP include such a management plan. The plan should be developed and implemented in conjunction with the University of California and the City of Berkeley. It must be noted, however, that unless such a plan is specifically required to achieve specific water quality standards, it would not meet the legal requirements for mitigation measures. The Council recommendation also requested that to mitigate any impacts on water quality, any remediation of contaminated soils be designed to meet standards to allow for the most sensitive future land uses. (See attached recommendation.)

This section and other use some terms that are not generally understood. For example, this section of the Initial Study states that airborne radionuclides emitted from the Berkeley Lab could degrade water quality. What are radionuclides? Are there accepted standards for radionuclide safety?

Additional issues regarding potential significant impacts on water quality are discussed below under "Utilities and Service Systems."

Land Use

In response to the question whether the project conflicts "with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project… adopted for the purpose of avoiding or mitigating an environmental effect?" the "Initial Study" states that the "LBNL site is not subject to local… land use planning…" (Checklist, p. 14, 9.b.) However this does not mean that the Berkeley Lab can ignore City land use policies and regulations to the extent of not considering them in the EIR. Local plans will inform the policies of the LRDP. Environmental impacts that may be mitigated or avoided should be considered even though the Berkeley Lab is exempt from City land use controls.

Because future development in the City should be consistent with the General Plan, the extent to which the LRDP is inconsistent with the City's General Plan must be considered a potentially significant environmental impact despite the fact that the City has very limited, if any, jurisdiction over the project itself. For this reason, the City requests that the section of the EIR addressing consistency with local plans address consistency with the General Plan and any applicable policies in detail, and propose mitigations to ensure that conflicts are avoided or minimized through appropriate mitigation measures. Mitigations proposed by the Berkeley Lab can be consistent with and contribute to the implementation of the General Plan.

Noise

The City requests that the analysis of noise impacts characterize the types of noise and the potential disruption of daily activities. Proposed mitigation should address both the qualitative and the quantitative impacts of noise. It is possible that noise mitigation will require extensive monitoring and enforcement, which should be funded by the Berkeley Lab. If the Berkeley Lab does not have any adopted standards that can serve as a basis for evaluating noise impacts, it would be appropriate to use the standards specified in the City's Community Noise Ordinance (BMC Chapter 13.40). These standards can be used to evaluate the significance of noise impacts and to establish performance-based mitigation measures especially during the construction period.

LBNL should be responsible for monitoring noise levels with a noise meter to ensure compliance with the Community Noise Ordinance. The maximum noise level allowed in the surrounding residentially zoned area is 60 /55dBA day or night. We suggest that some sort of mechanism for complaint resolution should be in place to accommodate residents around the construction areas especially in light of the extended construction process. Contractors should be required to post the name and phone number for a person who is authorized to resolve noise and other complaints about construction activity. Posted notices should specify the beginning and approximate completion dates of specific projects. LBNL can also use community meetings, flyers and the Internet to notify nearby residents. Other mitigation measures may include use of state of the art construction equipment that generates less noise and can be shielded or muffled to reduce noise levels and traffic control measures to ensure that noise from construction traffic doesn't affect the neighborhoods through which trucks travel. The EIR should recognize that violations might be subject to administrative citation under the Municipal Code.

Population and Housing

The EIR should consider not only the direct impacts of Berkeley Lab employment and residential growth, but also the indirect impacts. Certain types of employment growth, such as Berkeley Lab employment, have especially strong "multiplier" effects within the economy and generate additional jobs (usually service jobs). Similarly, housing growth has indirect impacts on schools and services that should be considered.

The "Initial Study" states that "by raising LBNL population ceiling by approximately 750," (Checklist, p. 16, 12.a) the proposed LRDP would probably have a slight impact on cumulative housing demand. However the relevant population increase is not between the current LRDP ceiling and the proposed LRDP ceiling, but between the current actual ADP and the proposed LRDP ceiling. This is a significantly greater incremental increase. The EIR should analyze the true incremental population increase, and should quantify the resulting impact on Berkeley's housing demand over the 21-year planning horizon.

Public Services

Even though the Berkeley Lab provides some facilities and services to accommodate the demand generated by its activities in Berkeley, any increase in development and associated growth in Lab population will have an impact on City facilities and services. The Lab should be mitigating these impacts by making direct financial payments to the City. Because of the uncertainty regarding the extent to which the LBNL may continue to occupy off-Hill leased space, it is particularly difficult to quantify these effects. The loss of tax revenues associated with off-campus and off-Hill activities combined with an increased need to provide police and fire protection and maintain the infrastructure that provides access, drainage, water, and wastewater services to the Hill site is a losing proposition for the City and its residents and business owners who may experience a deterioration of public services. The City will seek discussion with the LBNL staff about appropriate fiscal compensation for development and service activities. The following sections include more specific information regarding impacts on City facilities and services.

Fire Protection

The NOP states that the LBNL has "considerable on-site fire suppression capabilities" and will have three 200,000-gallon emergency water tanks on-site. The EIR must, however, also address the need for services that will have to be provided by the City of Berkeley Fire Department (BFD) as a result of additional development at the Hill site. The party responsible for preparing this section of the EIR should also obtain information from the BFD regarding additional measures that are recommended to improve capacity to deal with the additional risk posed by increasing development in this part of the City and the resulting increase in population at a site that is particularly susceptible to wildland fires.

The EIR should describe the potential increases in demand caused by increasing the number of buildings, the projected increases in population at the Hill site and in the City as a whole, and any changes in lab activities that may result in hazardous material spill or release. Though the

Lab has its own fire response capability provided through contract with Alameda County, the City of Berkeley Fire Department (BFD) responds to all structural fire calls on lab property. Additionally BFD provides back-up assistance for Hazardous Material calls. Any brush or grass fire on lab property will require a BFD response as part of the Lab Fire response. The Automatic Aid Agreement for the exchange of fire services between the Lab and the City of Berkeley describes the conditions under which BFD responds to the Lab. The EIR should address any potential impacts from development that might affect the agreement or that might lead to an increase in BFD emergency response under terms of the agreement.

The NOP states that under the LRDP there may be a 28 percent increase in the number of persons at the Hill site above the actual existing population. This increase will likely lead to a corresponding increase in calls for emergency medical service. Lab Fire provides first responder emergency medical service but the BFD is primary provider of ambulance service for the Lab. The EIR should address potential impact on BFD for ambulance service including any deterioration of existing service levels or increases in response time.

The EIR must also address site access issues associated with additional development including emergency access for fire response as well as provision for emergency evacuation of lab personnel. The "Initial Study" states that the Berkeley Lab's "on-site fire response equipment, water storage or distribution, and fire department may be expanded as needed to address any increases in demand." (Revised Initial Study, p. 16, 13.a., emphasis added). What does this mean? The EIR should include mitigation measures that either require the on-site capacity to be increased as necessary (which seems unlikely given the Berkeley Lab's recent history of cutbacks), or identify mitigation measures that would ensure that the City has adequate capacity to provide the needed fire response services. The party responsible for preparing the EIR should contact the BFD to determine if the provision of three 200,000-gallon emergency water tanks is sufficient given the type, location, and extent of new development proposed by the LRDP. In addition, new construction projects require evaluation of water supply and addition or relocation of hydrants. As the State-mandated authority for water supply for fire suppression, the Fire Department must be included in this review process to ensure appropriate fire protection is provided.

Without more specific information regarding the type and location of future development, it will be difficult to determine how implementation of the LRDP will affect the City's ability to provide fire services. The increased building sizes, complex building systems (fire protection and detection equipment) and building uses will lead to an increased volume of fire incidents. Additional factors resulting from proposed designs will require specialized equipment for the Fire Department in order to maintain the current level of fire protection. Such factors include, but are not limited to: building height, underground and below grade construction; new processes and operations; the conversion of private property to University property; and modifications of access to and on the campus.

Especially in light of the Hill site terrain, the Fire Department will be challenged by even mid-rise structures due to equipment restrictions. A number of the projects include new underground

or subterranean levels. Below grade construction, such the proposed Building 49, creates special problems for firefighters and requires specialized equipment and training. Building uses and operations associated with unfamiliar and potentially hazardous technologies will require constant training and equipment upgrades for the Fire Department. Without these upgrades the Fire Department will not be able to provide the desired level of fire protection safely.
At the present time, Fire Department access to the Hill site is a challenge. Additional development on this steep and remote site makes the maintenance of required fire access a major concern for the City. It is essential that the fire department be involved in the planning process for all construction projects to ensure that emergency access is maintained on the Hill site. Additionally, any road design changes or modifications that would affect emergency or fire vehicle access, (i.e. additions of traffic calming devices, barricades, detours, etc.) must include the Fire Department to ensure timely access and response onto the campus. The LRDP's proposal to create "Hill Town Research Clusters" is particularly troubling because of the particularly hazardous conditions associated with this hillside area. This proposal has the potential to compromise the Fire Department's response times and ability to provide fire services not only to the new Lab development, but also to the UC Campus and to the rest of the City of Berkeley. Mitigation measure must be designed to ensure no diminution in existing service levels.

The LRDP calls for a significant amount of new development, all of which will require fire protection services from the City. The normal development review process includes an opportunity for the City's Fire Department to review and approve plans, to ensure that adequate provision is made for fire safety. The development review process used by the Laboratory to date does not provide such an opportunity. As a result, the City's ability to provide adequate fire protection services can be compromised.

Accordingly, the City requests that the Lab formalize in its development review process for all developments under the LRDP to provide an opportunity for Fire Department review and input to address:

1. Fire Department access (i.e. road width, entry points to buildings, knox box locations and keys, etc.);
2. Water supply: We appreciate the current positive working relation between the Fire Department, the University, and the Berkeley Lab on fire access and water supply issues for existing and new facilities. This cooperation should continue.
3. The Lab should continue to provide fire protection systems in all facilities. Specifically, the Fire Department requests the installation of fire sprinkler systems in all new facilities, as well as a program to retrofit all existing campus facilities with fire sprinkler systems;
4. Location of Fire Department connections (to include 5" stortz fittings);
5. Provision of site plans for inclusion in the UC Map Books carried on all apparatus;
6. Prior to occupancy of the building, provide a detailed list of the building use and location of hazardous materials;

7. Location and design of Fire Control rooms;
8. The Lab should provide pre-planning, training, and tours for Fire Department personnel, to familiarize them with the campus and off campus buildings. This should include fire protection equipment, chemical processes, storage and other life safety hazards;
9. The University invested in improvements of equipment and training for the Fire Department under the last Long Range Development Plan. The Fire Department would like to develop a new investment plan with the University and the Berkeley Lab that will allow the Department to meet the level of service the University and Lab wish to maintain. Only a fully funded investment program in equipment, special services and training for the Fire Department will maintain the desired level of service to the university.

Finally, because the types of buildings and uses at the Hill site will likely demand different or additional services and equipment than most other development in the City, there should be a process for determining future impacts of development under the LRDP on fire protection and disaster response services and a means to mitigate those impacts.

Police Protection

As it does with respect to fire protection, the "Initial Study" states that the on-site security forces "likely would be expanded as needed…" (Checklist, p. 16, 13.a.) Again, the EIR needs to clearly identify the appropriate mitigation measure, and the Berkeley Lab needs to commit itself to that measure. Contingent statements that the Berkeley Lab "may" or "likely would" increase its capacity to deal with emergencies are not adequate.

Schools

The impact of additional staff and guests on schools should be quantified and measures devised to mitigate it. The reference to an analysis of "both on- and off-site security and police protection providers" in the discussion of school impacts appears to be a word processing error.

Similarly, the additional staff and guests that the LRDP calls for will place additional demand on the City's public library system. This impact should be quantified and measures devised to mitigate it. We would be happy to make staff from the Library available to discuss possible mitigations.

Parks/Recreation

An increase in staff and guests is likely to increase the use and maintenance requirements of the City parks and recreational facilities. The resulting physical impacts on these parks, as well as mitigation measures for those impacts, should be fully considered in the EIR. It is not sufficient to state, "new or expanded recreational facilities are not expected to be a result… of the proposed project." (Checklist, p. 17, 14(b).) That is not responsive to the question of whether the project will necessitate new or expanded recreational facilities. Impacts of concern include increased use of existing recreational opportunities, accelerated wear on facilities that will increase both capital and maintenance expenditures, displacement of recreation facility users to other sites, and loss of open space.

Transportation and Traffic

The "Initial Study" appears to rely on appropriate design of new roads to mitigate both safety impacts (Checklist, p. 18, 15.d) and impacts on emergency access. (Id., 15.e.)
Given the difficult topography, and the Berkeley Lab's failure to identify where new buildings might be located, the EIR cannot assume that it will be possible to design all new roads appropriately. The best indication of this is the existing road network that serves the Berkeley Lab. Moreover, while appropriate design might mitigate safety concerns under normal circumstances, it does not necessarily ensure adequate emergency access.

The NOP states that the Hill site generates "several thousand" one-way vehicle trips on a typical workday. Unless there has been a substantial reduction in the number of employees who commute by personal automobile, this figure may be substantially understated. According to the 1987 LRDP, as of that year the ADT number was close to 7,000 and projected to increase to almost 10,000 trips a day. The NOP does not indicate what proportion of the LBNL population takes advantage of the shuttle service but with almost two parking spaces per person, there would appear to be little incentive for reducing drive-alone trips.

Although the NOP contains no information on the number of new parking spaces that the LBNL expects to provide over the course of the LRDP, the NOP refers to a projected parking objective of 1.7 employees per parking space, a slightly different measure than the 1.7 "population" per parking space figure cited in the 1987 LRDP. Based on the projected population, more than 1,000 additional parking spaces would be required to maintain the 1.7 persons/parking space objective. The EIR needs to thoroughly evaluate the range of environmental impacts associated with the application of this "policy" or of whatever number of additional parking spaces will be provided. The EIR should also propose mitigation measures based on quantifiable objectives for reducing drive-alone trips. The City Council recommendation on November 25, 2003 requests that the LRDP provide for a reduced parking ratio in order to encourage transportation alternatives.

We note that although the first proposed Circulation and Transportation policy is to "promote alternative forms of transportation" that laudable policy is followed with "provide parking to support a campus-like setting and increased population". In other words, the proposed policies not only omit any performance standard to support increased use of alternative forms of transportation but also fail to indicate any willingness to maintain or improve the 1.7 employees per parking space objective as stated on p. 5. The LRDP and EIR need to clarify this ambiguity in the LRDP policies and describe the Lab's linkage (or absence) of transportation-related performance standards to the LRDP's "zone-based" approach to land use planning so that meaningful impact analysis can proceed.

As a threshold matter, basic analytical assumptions about such matters as parking turnover, vehicle occupancy and the relationship between parking supply/occupancy and traffic generation are fundamental to the EIR's analysis of impacts and identification of mitigation measures. We request an opportunity for City staff to meet with LBNL staff to discuss, and hopefully agree upon, these assumptions.

The "baseline" condition should be current conditions, as opposed to current conditions plus approved projects that have not yet been built or completed. The baseline condition can be measured, while "baseline plus assumed impacts" will necessarily be inaccurate.

The NOP states that the EIR will analyze the impact of increased vehicular traffic on "local streets and the adjacent regional highway system" (Checklist, p. 18) but provides no further detail about which roads, streets, and intersections will be studied. The EIR needs to examine impacts on traffic corridors that accommodate the majority of trips to and from the Hill site including Grizzly Peak Boulevard/Claremont; Gayley Road/Centennial Drive; Tunnel Road/Claremont/Derby/Warring/ Piedmont Corridor; College to Oakland; Shattuck to Oakland; Hearst/Oxford/Shattuck/University. Telegraph Avenue, of course, is also critical.[5] The NOP also fails to mention the AC Transit BRT EIR, especially in Section 12(f) of the Initial Study, which mentions commute patterns of Lab employees. (Checklist, p. 16.) The EIR's analysis should satisfy the above analytical criteria.

Specific consideration must be given to the effect that additional development will have on access to and from the Panoramic Hill area, which encompasses portions of Oakland as well as Berkeley. The intersection of Panoramic Way and Canyon Road is the only point of access to this neighborhood. Any increase in traffic to Canyon Road will exacerbate existing access problems for emergency vehicles and must be considered a potentially significant impact in light of the threat to public safety. To the extent that increased enrollment exceeds the supply of student housing, implementation of the LRDP may also increase the total student population in this area, which includes many group living accommodations. Improvement to emergency access along the lines that are suggested in the previous discussion of Fire Protection could help to mitigate projected increases in both traffic and the Panoramic Hill population.

Off-Hill facilities appear to have been excluded from the NOP. However, there could be a direct correlation between increased development at the Hill site and activity at off-site locations such as warehousing and receiving facilities located in Emeryville and Berkeley, the Printing Plant in West Berkeley, and the Richmond Field Station and traffic activity to and from the main campus.

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5 Similarly, the EIR should review pedestrian routes and crossing locations at points a healthy distance from the Hill site, with explicit reference to the City's approved Bike Plan. The Checklist states that the EIR will evaluate increase hazards to pedestrians and bicyclists but does not provide any detail as to this issue. We offer this suggestion as part of the City's effort to ensure that all issues of concern are adequately addressed in the draft EIR.

The EIR should fully analyze the traffic impacts of the use of these facilities, and in particular traffic between these locations and facilities at the Hill site.

With respect to mitigation measures, the EIR should include: the possibility of integrating with the AC Transit BRT EIR on Telegraph Avenue; a detailed analysis of possible TDM strategies and programs; potential integration of shuttle bus services near the campus; promotion and design of facilities for Segway HT–type alternatives; and increased parking enforcement in the adjacent neighborhoods, such as RPP enforcement. To the extent mitigation measures (such as increased parking enforcement) involve or require City participation, City staff would be pleased to discuss specific options with the University prior to or during preparation of the draft EIR.

The EIR should generally address mitigation of the impacts of additional vehicle trips through Berkeley to campus or off-campus parking locations. As noted elsewhere in the City's comments, the Alta Bates Summit Medical Center project offers a local model for mitigation and monitoring. Specifically, the EIR should address the strategies in the 2001 "Southside/ Downtown Transportation Demand Management Study" (pages 10-1 through 10-41) as possible mitigation for expansion proposed in the LRDP.

Additional mitigation measures the EIR should analyze are:

- Encouraging carpooling.
- Increasing the supply of secure parking for bicycles on campus. Bicycle parking is inadequate and bicycle theft is a big problem that discourages bicycle commuting by students and staff.
- Designating more convenient bicycle lanes in the no-riding areas of campus.

With respect to construction/demolition traffic impacts, the EIR must include both specific and generic construction mitigation strategies, which the Berkeley Lab will undertake to minimize construction impacts within the adjacent neighborhoods. Mitigation measures and development alternatives that minimize the need for excavation and hauling fill from the site could substantially reduce the impacts associated with construction-period truck traffic. Some other mitigation measures include:

- Construction should not begin before 8:00 a.m., and should stop by 5:00 p.m., on weekdays at any sites that are adjacent to residential uses. There should be no construction work on Sundays or holidays. Related to this, there should be a concerted effort to reduce construction-related noise.
- The Berkeley Lab should commit to early stage notification of nearby residents and interested parties and should consult before finalizing plans and designs for development of specific projects on sites on and off campus. In addition, the Berkeley Lab should establish a regular, effective and timely process for acting on specific resident questions and complaints regarding construction impacts.

Utilities and Service Systems

The NOP largely ignores potential impacts to the City's sanitary sewer (wastewater) collection system, instead referring mainly to the capacity of the EBMUD wastewater treatment plant. (See, Checklist, pp. 19-20.) The NOP makes an abbreviated reference to "wastewater… conveyance facilities," but does not elaborate on the type or level of analysis of impacts on these facilities that the EIR will include. In view of existing capacity limitations and infiltration and inflow (I/I) of storm water into existing sanitary sewers, the EIR should address peak sanitary sewer flows from Berkeley Lab property during the wet weather season. Peak sewer flows during wet weather are dependent on the severity of the storm event (i.e., 5-year storms and greater) and could vary as high as 6 to 10 times dry weather sewer flows in the affected City facilities. The EIR should also identify effective mitigation measures for the additional demand the LRDP will place on the existing sanitary sewer system.

The City is currently under a 1986 Cease and Desist Order (CDO) from the Regional Water Quality Control Board to eliminate all sewer overflows from the city's wastewater collection system.[6] Under the CDO-mandated compliance plan, approximately 50% of the sanitary sewer system (49 out of 81 sub-basins, serving approximately 60% of the City's geographic area) must be replaced or rehabilitated, to reduce the I/I flows to the collection system and EBMUD treatment plant.

The NOP recognizes that the East Bay Municipal Utility district operates the wastewater treatment plan that serves the City of Berkeley but fails to acknowledge the City's responsibility for maintaining the sanitary sewer collection system that transports wastewater to the EBMUD plant. The EIR needs to identify the existing and projected peak wastewater flows from the Lab facilities to the City collection system during dry and wet weather seasons, infiltration and inflow flows into the City's sewer collection system. The City sewer collection system is subject to high I/I flows during wet weather flows and could vary as high as 6 to 10 times dry weather sewer flows. The EIR should address locations and monitoring of wastewater flows where the Lab discharges into the City sewer system and compliance with EBMUD industrial discharge concentration limitations. The EIR should also propose mitigation measures to reduce I/I into the wastewater collection including condition assessment of any existing sewer lines that may be inadequate to handle increased flows.

Any new development at the Berkeley Lab will have a significant impact on the downstream City sewer mains on Prospect Street and Dwight Way, which presently do not have peak sewer flow capacities for additional development. These impacts, and mitigations for them, should be fully analyzed in the EIR. In addition, cumulative wastewater contributions from both the Berkeley Lab and U.C. LRDPs should be addressed. The storm water pollution prevention

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6 Moreover, it appears that upon renewal the City's NPDES permit for wastewater discharge will prohibit any sewer overflows, regardless of the severity of the storm event.

requirements specified in BMC Sec. 17.20 should be used as a basis for designing a storm water management plan.

In sum, the EIR should address the impacts of the development under the LRDP (as well as cumulative U.C. and Berkeley Lab development) on the City's sanitary sewer system and the City's ability to comply with the CDO and its NPDES permit, and water quality. The EIR should also state the Berkeley Lab's plans in this regard with respect to the sub-basins for which it is responsible (i.e., what it intends to do to reduce peak wet weather sewer flows into the City sanitary sewer system on Berkeley Lab property). Specifically, the Berkeley Lab will need to replace aged sewers and reduce I/I flows during peak winter flows from its facilities into the city collection system. Finally, the EIR should identify effective mitigation measures for these impacts. As the Berkeley Lab is aware, the City has a long-term maintenance/replacement program. Contributions to that program would clearly constitute mitigation measures. We would be pleased to discuss the specifics of these programs in greater detail during preparation of the EIR.

Cumulative Impacts

We are pleased to see that the EIR will consider the cumulative impacts of the Berkeley Lab LRDP in combination with UC Berkeley LRDP and the growth and development that the City anticipates under the revised General Plan. (NOP, p. 11) We assume that this means that the EIRs for each of the LRDPs will include the other LRDP as a project contributing to cumulative impacts and that both EIRs will use the same data and assumptions about baseline conditions. Both EIRs should employ a common list of other past, present, and probable future projects that will be used as a basis for the respective analyses of cumulative impacts to ensure that analyses of impacts and mitigation measures are directly comparable. In addition, both EIRs should use the same terminology and methodology for the same kinds of impacts.

Since both projects are under the jurisdiction of the Regents, we would expect that the analysis each EIR includes of ways to mitigate cumulative impacts resulting from the other LRDP would be correspondingly more detailed. Moreover, given that both LRDPs are projects being undertaken by the Regents, we expect that mitigation of all impacts that result from the cumulative impact of the two LRDPs will be considered feasible because they are within the jurisdiction of the same agency.

We have discussed key points relevant to the EIR's analysis of cumulative impacts in a number of contexts in the preceding parts of this letter. We will add only that, in addition to its use of projections, the EIR should be as specific as possible about individual projects that will contribute to cumulative impacts, if they are known or reasonably foreseeable. Because both the LBNL and the UC Berkeley NOPs are extremely vague regarding the nature and location of projects that may be undertaken under these plans, we will be paying close attention to the adequacy of this section of the EIR.

In closing, I would like to reiterate the City's appreciation of this opportunity to provide early and meaningful comments on the scope and contents of the upcoming EIR, and the invitation to work closely with the City in drafting an EIR that will fully address both our agencies' needs.

Sincerely,

Phil Kamlarz
Acting City Manager

Attachment

cc: Mayor Tom Bates and Members of the City Council
Arrietta Chakos, Assistant City Manager
Grace Maguire, Assistant to the City Manager
Senior Leadership Collaborative
City of Berkeley Commission Secretaries
Ed Denton, Vice Chancellor, UCB
Horace Mitchell, Vice Chancellor, UCB
Tom Lollini, Assistant Vice Chancellor, UCB
Irene Hegarty, Director, UCB
Kerry O'Banion, Principal Planner, UCB
Jennifer Lawrence, Senior Planner, UCB

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#24

To Honorable Mayor and Members of the City Council

Subject: Lawrence Berkeley National Laboratory (LBNL) Notice of Preparation for Long Range Development Plan

RECOMMENDATION: that the City Council request that

1. As part of the 2004 Long Range Development (LRDP) Environmental Impact Report (EIR), LBNL review the potential environmental & health impacts of the sub fields of nanoscience in which research activities will be carried out at the LBNL site.
2. All nano-science and technology research projects at LBNL undergo an independent evaluation process to access health and safety issues before being allowed to proceed. This evaluation process will be done by an independent Health and Safety Review Committee of knowledgeable experts and shall be approved by the City of Berkeley.
3. LBNL agrees to provide the results of the initial startup health and safety and environmental reviews of all proposed nanoscience research projects including those to be conducted at the Molecular Foundry, and the annual health and safety reviews of all continuing research projects to the City and the public in a timely fashion.
4. LBNL agrees to help facilitate an independent biannual health and safety review of all of the nanoscience research carried out at LBNL. This would be conducted by the Health and Safety Review Committee (See#2).

From CEAC to contribute to the public record, to recommend to LBNL, and to recommend to City Council to direct City Manager to send a letter to LBNL, requesting that the LBNL include a comprehensive analysis of the following as part of the LBNL LRDP EIR current under preparation:

1. A comprehensive Watershed Management Plan
2. The need to protect and preserve open space such as by using infill developments.
3. Do not increase square footage of developed land per employee unless explicitly and publicly justified.
4. Plan fewer parking places per employee than is current practice with the encouragement of alternative transportation.
5. Cleanup of soils and groundwater should be to the highest possible standards, which allows for the most sensitive future land uses.

BACKGROUND

Lawrence Berkeley National Laboratory has been conducting research in nanoscience for over ten years and has extensive experience in assessing any associated hazards.

Extensive safety programs are in place to protect the health and safety of its staff, the public and the environment. New construction projects and facilities modifications are

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reviewed for hazards and risks, and to ensure that appropriate Environmental Safety & Health (ES&H) features are integral to the planned project or facility. ES&H requirements identified through this process are incorporated into the project's design.

As part of the planning process, principal investigators, managers, and supervisors are required to consider what ES&H hazards, risks, and concerns are present, and to implement appropriate controls. Depending on the hazard, the principal investigator, supervisor, or manager must document the work and associated hazards, describe administrative and engineering controls, and document training or certification for the participants. The various processes ensure that experts with appropriate certifications or background are brought into the process for review or approval.

MOLECULAR FOUNDRY PROJECT

An assessment of hazards has been carried out in a Preliminary Safety Analysis Report (SAR):

1. Lead scientists were interviewed for each of the six research areas to determine the spectrum of hazards, materials, and equipment proposed for his/her Foundry research.
2. Preliminary information indicated that no radioactive materials or biohazards were planned to be used at the Molecular Foundry. Potential chemical inventories were obtained from the lead scientists and compared to standards with established threshold limits, including the California Building Code occupancy requirements, the San Francisco Bay Area Air Quality Management District, Threshold Quantities contained in the Clear Air Act, and OSHA regulations for Process Safety Management of Highly Hazardous Chemicals.

Building Safety Design Standards

All laboratories in the Molecular Foundry will meet the California Building code H-8 occupancy standards, which is a classification for "laboratories and similar areas used for scientific experimentation or research". Laboratories that meet these safety standards are certified to handle or store limited amounts of hazardous materials.

Existing LBNL Environment Safety & Health Reviews

1. All activities and projects are reviewed through various annual and tri-annual assessments, including the division self-assessment, EH&S inspections, the IFA, the SRC Management of Environment, Safety and Health (MESH) review.
2. DOE Berkeley Site Office conducts continuous reviews of the EH&S program and summarizes its findings in an annual report.
3. DOE Headquarters (both the Office of Independent Oversight and the Office of ES&H) conduct reviews of elements of LBNL's ES&H program.
4. UC President's Council, ES&H Panel conducts an annual on-site review. Their overall charter is to evaluate the EH&S systems in place

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at LBNL. Normally, two or three facilities or programs are selected at each on-site visit for a more in-depth evaluation of ISM (Integrated Safety Management) implementation. In the past, that has included the NTLF, ALS, the Hazardous Waste Handling Facility, and the new Genomics building. Results of the Panel's work are contained in public reports available from UCOP, Vice President of Lab Management. The Panel is staffed with faculty from UC and other Universities, professionals from various EH&S disciplines including Health Physics, Industrial Hygiene, Occupational Medicine, Safety Engineering, and Environmental Programs, and one attorney.

5 EH&S Peer Reviews are conducted once each three years (triennially) with the last one having been completed in early 2001. Peer reviews are typically staffed with EH&S Professionals from other Office of Science Laboratories, academia, and the private sector. EH&S Peer Reviews do not include other UC or DOE employees.

BERKELEY

Office of the City Manager

LAWRENCE BERKELEY NAT'L LAB
DEC -9 2003
FACILITIES PLANNING

December 2, 2003

Jeff Philliber
Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90K
Berkeley, CA 94720

Re: Supplemental Comments to City of Berkeley Response to Preparation of Draft Environmental Impact Report: LBNL 2004 Long Range Development Plan

Dear Mr. Philliber:

The attached comments from the Public Works Department's Engineering Division were mistakenly omitted from our letter of November 26, 2003. Although November 26 was the deadline for submitting comments on the Notice of Preparation, we felt it was important that the Berkeley Lab be aware of these issues as it prepares the Draft EIR.

Please don't hesitate to contact Grace Maguire should you need any clarification of the information in the memo.

Sincerely,

PHIL KAMLARZ
Acting City Manager

cc: Arrietta Chakos, Assistant City Manager
Grace Maguire, Assistant to the City Manager
Rene Cardinaux, Director of Public Works
Jeff Egeberg, Manager of Engineering
Lorin Jensen, Supervising Civil Engineer
Irene Hegarty, Director, UCB
Kerry O'Banion, Principal Planner, UCB
Jennifer Lawrence, Senior Planner, UCB

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E-mail: manager@ci.berkeley.ca.us

Department of Public Works
Engineering Division

MEMORANDUM

DATE: November 14, 2003

TO: Jeffrey Egeberg, Manager of Engineering

COPY: Lorin Jensen, Supervising Civil Engineer

FROM: Danny Akagi, Assistant Civil Engineer

SUBJECT: Notice of Preparation, Draft Environmental Impact Report, LBNL 2004 Long Range Development Plan, Storm Water Comments

I reviewed the Notice of Preparation, Draft EIR (NOP) for the LBNL 2004 Long Range Development Plan; with the intent of providing comments related to the storm water elements of the project. Following are my comments.

INSUFFICIENT DETAIL TO IDENTIFY IMPACTS

The overall project does not contain sufficient detail to provide comments on storm water impacts. Most discharges will enter the Strawberry Creek watershed, however, the site is so large, it can potential discharge to the Schoolhouse Creek watershed as well. Further, in the Strawberry drainage, the natural and manmade storm drain system/facilities are further divided into two distinct drainage systems, until they come together at Browning and Addison Streets in West Berkeley. The portion of the creek that generally follows along Allston Way contains two open channel sections.

From the information in the NOP, it appears that the potential increase in runoff from impermeable building area (without parking lots) in the Year 2025 condition compared to the current level is 45% (1.76 million sq ft today, 2.56 million sq ft in 2025). This is a significant discharge, especially if it is concentrated into only one of the drainage systems, and more significantly if it is discharged to the portion of the creek with vulnerable, private property open channels.

OPEN CHANNEL IMPACTS

The open channel sections are located at Strawberry Creek and between Acton Street and Allston Way. The City is required to exercise Section C3 of our recently renewed storm water discharge NPDES permit. Provision C3 includes exemptions for street pavement work and single-family residences. Neither of these applies to LBNL (industrial) facilities. Hydromodification (increases to runoff, primarily from impervious area) from the site must be controlled and water quality control best management practices (BMPs) must be implemented.

Much of the open channel sections lie on private property, with the built out condition in Berkeley having reached the flow capacity of these sections. Though the area of buildings might be small in comparison to the overall canyons, the time of concentration (time required for the flow to leave the site and corresponding peak flow) and peak flow behavior of impervious area can adversely affect the open channel sections of the creek.

ENVIRONMENTAL CHECKLIST, 8a

The checklist indicates that the "... EIR will evaluate impacts to water quality from runoff and....". For runoff, the City's permit requires BMPs be incorporated into designs where practicable, and the use of structural and cultural BMPs or devices when BMPs are not designed into the project. Evaluating the impacts is not the test for determining if a violation occurs; the NPDES permit already requires implementation of BMPs to the extent practicable. The NOP should indicate that the University would comply with requirements of the City's NPDES permit.

ENVIRONMENTAL CHECKLIST, 8d

The potential increase in flow (45%, see above) can significantly alter flow patterns. Individual projects must be examined for impacts to the drainage systems in order to avoid overloading existing systems or creating damage to privately owned properties off site. This checklist item must be coordinated with checklist item 16c.

ENVIRONMENTAL CHECKLIST, 16c

There is a significant potential for increasing runoff from the site. The increased flow will require additional downstream facilities to convey the flows to the Bay. Further, constructing such facilities will severely drain the City's funding capabilities to perform capital improvements for other new and rehabilitation/replacement projects.

EAST BAY
MUNICIPAL UTILITY DISTRICT

November 26, 2003

Jeff Philliber
Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90K
Berkeley, CA 94720

Dear Mr. Philliber:

Re: Revised Notice of Preparation for a Draft Environmental Impact Report (EIR) – Lawrence Berkeley National Laboratory 2004 Long Range Development Plan, Alameda County - SCH 2000102046

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to review the Revised Notice of Preparation for a Draft Environmental Impact Report for Lawrence Berkeley National Laboratory (LBNL) 2004 Long Range Development Plan in Alameda County.

WATER SERVICE

Pursuant to Sections 10910-10915 of the California Water Code, the proposed project meets the threshold requirements for an assessment of water supply because the entire scope of this project would demand an amount of water greater than the amount of water required by an increase of approximately 800,000 gross square feet and the population growth of about 30 percent. The project sponsor should contact EBMUD and request a Water Supply Assessment (WSA). Please be aware that the WSA can take up to 90 days to complete from the day on which the request is received.

The LBNL site area is served by EBMUD's Shasta Pressure Zone (PZ), that provides water service to customers within an elevation range of 900 to 1,050 feet, and the Berkeley View PZ that provides water service to customers within an elevation range of 1,050 to 1,250 feet. The LBNL site receives its water supply via a 12-inch meter in Campus Drive in the Shasta PZ and via a 6-inch meter in Summit Road from the Berkeley View PZ. The Draft EIR should identify the projected water demands due to the projected growth. Further, the Draft EIR should address any potential impacts to the source water and facilities in these pressure zones serving the LBNL area.

WATER CONSERVATION

The LBNL 2004 Long Range Development Plan presents an opportunity to incorporate many water conservation measures. LBNL should include in its conditions of approval for the implementation of the 2004 Long Range Development Plan amendments that the project complies with EBMUD water service regulations and obligations to efficiently manage water supply. EBMUD staff would appreciate the opportunity to meet with LBNL staff to discuss water conservation programs and best management practices applicable to the project area. A key objective of this discussion will be to explore timely opportunities to expand conservation via early consideration of EBMUD's conservation programs and best management practices applicable to the project.

WASTEWATER PLANNING

EBMUD's Main Wastewater Treatment Plant is anticipated to have adequate dry weather capacity to treat the proposed wastewater flow from this project, provided this wastewater meets the standards of the EBMUD's Source Control Division. However, the City of Berkeley's (City) Infiltration/Inflow (I/I) Correction Program set a maximum allowable peak wastewater flow from each subbasin within the City. EBMUD agreed to design and construct wet weather conveyance and treatment facilities to accommodate these flows. EBMUD prohibits discharge of wastewater flows above the allocated peak flow for a subbasin because conveyance and treatment capacity for wet weather flows may be adversely impacted by flows above this agreed limit. LBNL needs to confirm with the City of Berkeley Public Works Department that there is available capacity within the subbasin flow allocation and that it has not been allocated to other developments. The projected peak wet weather wastewater flows from this project need to be determined to assess the available capacity within the subbasin and confirmation included in the EIR. Suggested language to include in the EIR is as follows: "The City of Berkeley Public Works Department has confirmed that there is available wastewater capacity within Subbasin *(insert subbasin number here)* for this project."

In general, the project should address the replacement or rehabilitation of the existing sanitary sewer collection system to prevent an increase in I/I. Please include a provision to control or reduce the amount of I/I in the environmental documentation for this project. The main concern is the increase in total wet weather flows, which could have an adverse impact if the flows are greater than the maximum allowable flows from this subbasin.

WATER RECYCLING

LBNL has been identified as a potential customer for a Satellite Recycled Water Treatment Facility. A Satellite Recycled Water Treatment Facility Feasibility Study is currently underway. This study will evaluate the feasibility of constructing a small Satellite Recycled Water Treatment Facility to serve a large customer within the EBMUD wastewater service area. EBMUD staff will continue to work with LBNL to investigate the possibility of serving the campus with recycled water from a Satellite Recycled Water Treatment Facility.

If you have any questions concerning this response, please contact Marie A. Valmores, Senior Civil Engineer, Water Service Planning, at (510) 287-1084.

Sincerely,

William R. Kirkpatrick
Manager of Water Distribution Planning

WRK:NJR:sb
sb03_325.doc

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

November 14, 2003

Jeff Philliber
Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90K
Berkeley, CA 94720

Subject: Lawrence Berkeley National Laboratory 2004 Long Range Development Plan

Dear Mr. Philliber:

The Bay Area Air Quality Management District (District) staff have received your agency's Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the Lawrence Berkeley National Laboratory (LBNL) 2004 Long Range Development Plan (LRDP). The 2004 LRDP will provide a physical development framework for LBNL through the year 2025. Implementation of the plan would increase the total building area in the Lab's main Berkeley Hill site by 800,000 gross square feet.

We agree with the NOP's conclusion that the DEIR should analyze the LRDP's potential impacts upon air quality. The Bay Area is currently a non-attainment area for federal and state ambient air quality standards for ground level ozone, and state standards for particulate matter. The air quality standards are set at levels to protect public health and welfare. The major source of air pollution in the Bay Area is motor vehicles. Toxic air contaminants are also an area of serious concern in the Bay Area. Any project with the potential to expose sensitive receptors or the general public to substantial levels of toxic air contaminants would be deemed to have a significant impact. As general background for readers, the DEIR should discuss the health effects of air pollution, the region's attainment status with regard to ambient air quality standards and the contribution of mobile and stationary sources to air pollution emissions.

The DEIR should analyze the potential impacts on air quality from project construction and project operation at buildout. If significant air quality impacts are identified, the DEIR must include all feasible mitigation measures to reduce the air quality impacts. We suggest that the University do as much as possible to reduce vehicle trips associated with the project. Motor vehicles constitute the largest source of air pollution in the Bay Area; therefore, we have a strong interest in promoting alternative modes of transportation. The LBNL Hill site is currently served by a campus shuttle but because of its hilly location is often difficult for pedestrians and bicycles to conveniently access. The DEIR should identify strategies to strengthen linkages between the project site and nearby mass transit facilities.

We encourage the University to consider the "Reduced or No New On-site parking growth" alternative described in the Initial Study. Under this alternative, projected growth in LBNL population and space would not result in new parking spaces and alternative modes of transportation would be more greatly emphasized. An over-supply of parking is one of the reasons why people do not consider alternatives to the single-occupant vehicle. We recommend that the University reduce the number of additional parking spaces being proposed in the LRDP and to implement a parking cash-out program. Parking cash-out requires employers to provide transit and/or ridesharing subsidies to non-driver employees in amounts equivalent to the value of the subsidized parking, thereby encouraging those who would normally drive alone to consider a commute alternative.

In addition, the University can further reduce vehicle trips by incorporating as many appropriate transportation demand management (TDM) measures as possible, including: transit subsidies such as the Commuter Check program for LBNL staff and employees; guaranteed ride home program; flexible work schedules; bicycle and pedestrian incentive programs; and others listed in our guidance document, *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans (1999)*, mentioned below.

The DEIR should also evaluate potential nuisance impacts, such as exposure to odors and dust that could result from project implementation. Odors and dust may not necessarily cause physical harm, but can still be unpleasant and can motivate citizen complaints. Air quality problems arise when sources of air pollution and sensitive receptors are located near one another. Particulate matter (PM) is a pollutant of concern for both nuisance and health-related reasons. PM larger than ten microns is more likely to be a public nuisance than a serious health hazard. On the other hand, research has demonstrated a correlation between high levels of fine PM and increased mortality rates and high incidences of chronic respiratory illness. The DEIR should evaluate potential impacts and propose appropriate mitigation measures.

Some equipment at the Lawrence Berkeley National Laboratory may be subject to District regulations and permit requirements. Please note that the District has regulations regarding power generation (including back-up generators) and has recently strengthened our regulations concerning various solvent cleaning processes. We recommend that whenever new facilities are proposed, LBNL contact our Permit Services Division at (415) 749-4990 for information regarding District regulations and permit requirements.

For more details on our agency's guidance regarding environmental review, we recommend that the College refer to the *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans (1999)*. The document provides information on best practices for assessing and mitigating air quality impacts related to projects and plans, including construction emissions, land use/design measures, project operations, motor vehicles, nuisance impacts and more. If you do not already have a copy of our guidelines, we recommend that you obtain a copy by calling our Public Information Division at (415) 749-4900 or downloading the online version from the District's web site at http://www.baaqmd.gov/pln/CEQA/ceqaguide.asp.

If you have any questions regarding these comments, please contact Suzanne Bourguignon, Environmental Planner, at (415) 749-5093.

Sincerely,

William C. Norton
Executive Officer/APCO

WN:SB

cc: BAAQMD Director Roberta Cooper
BAAQMD Director Scott Haggerty
BAAQMD Director Nate Miley
BAAQMD Director Shelia Young

SIERRA CLUB
FOUNDED 1892

Northern Alameda County Regional Group
(Alameda-Albany-Berkeley-Emeryville-Oakland-Piedmont-San Leandro)
2530 San Pablo Avenue, Suite I, Berkeley, CA 94702
510-848-0800 (voice) · 510-848-3383 (fax)

January 16, 2007

Jeff Philliber
Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory
One Cyclotron Road MS 90K
Berkeley, CA 94720
Via email: LRDP-EIR@lbl.gov

Dear Mr. Philliber:

Please find following the Sierra Club's comments on the Notice of Preparation for the Lawrence Berkeley National Laboratory Long Range Development Plan. We look forward to being involved in the remainder of this process. Unless I hear otherwise from you, I will assume I don't need to send you a fax or hard copy of these comments. Please contact me at 510-663-6200 if there are any questions.

Thank you.

Sincerely,

/s/

Steve Bloom, Group Chair

A. Parking/Circulation, TDM Alternative, and Air Quality

1. Impacts to Address Regarding Circulation/Parking and Air Quality:

The EIR should address impacts on Level of Service and air pollution on all streets within a five block radius of any entrance to the lab, and access roads including College, Parker, Piedmont, Hearst, Shattuck, University up to a mile from the edge of campus.

The EIR should consider that it likely that Telegraph Avenue will have one lane of traffic for single occupant automobiles, with the other lane for bus rapid transit, and with the possibility of carpools. AC Transit and the Cities of Oakland and Berkeley expect Telegraph to be a more transit-oriented street, and this project will have cumulative impacts as part of Telegraph BRT. The cumulative impacts analysis and the assessment of TDM measures should address Telegraph-Downtown Berkeley as a Bus Rapid Transit Corridor.

2. Land Use

The EIR should review the city of Berkeley General Plan for policies concerning new office space and preservation of open space.

3. Alternatives List Inadequate – Needs TDM Evaluation

The alternatives presented in the NOP are inadequate without evaluation of Transportation Demand Management to hold auto trips at the same levels. The Sierra Club recommends a full analysis of Transportation Demand Management (TDM), including Eco Pass, as an alternative to parking.

Significant adverse impacts will likely occur if there is an increase in vehicle trips. This alternative would call for implementation of TDM policies, including but not limited to Eco Pass, designed to improve mode split by encouraging alternatives to driving alone to campus. There would be a goal of no additional single-occupancy-vehicle trips to the lab, and a mitigation monitoring plan would survey staff, and conduct counts as appropriate, to monitor the mode split.

This alternative would mitigate the undesirable detrimental impacts of increased traffic pollution generated by a small increase in traffic resulting from increased headcount. Concerns might still be present if the level of parking impacts the environment beyond the mitigations of TDM. TDM may not be just an alternative, but should be part of the preferred alternative and part of the LRDP policies. It is essential that there be environmental analysis of a TDM/reduced demand for parking option.

Figures 9.3, 9.4 and 9.5 from the Joint UC/City of Berkeley TDM Study show how improved mode split for students, faculty and staff could eliminate the need for more parking. The figures also show that even if mode split does not improve, the amount of extra parking needed by 2010/2011 is much less than the amount UC is proposing.

TDM programs have also been successful at Stanford and UCLA. Stanford already has a University Pass/Eco Pass program along with a "Clean Air Cash" program where employees get cash rewards for doing without a parking permit and using alternative modes. The University of Colorado at Boulder also has a successful Eco Pass program.

The EIR should also address pricing alternatives as part of TDM. Professor Donald Shoup at UCLA found that free parking discourages transit use; the more parking costs, the more likely you are to use transit. Financial considerations are a factor in mode choice, so UC should analyze its ability to mitigate environmental conditions using pricing. Even a small percentage in mode shift to transit would result in a significant improvement over the base case.

B: Open Space, Wildlife, Water Quality, Hydrology

The NOP indicates that there are likely to be numerous significant impacts to biological resources such as open space and wildlife, as well as to water quality and hydrology. In particular, the inclusion of the Hill Campus area as a zone in which extensive development is proposed presents real concerns with respect to significant environmental impacts.

The additional development on the hill raises concerns about the ecosystem and preservation of open space. This additional development will be located in current open space areas, and thus will extensively impact the associated biological resources. In addition, numerous traffic, aesthetic, air quality, and other significant impacts (discussed in other sections of these comments) are nearly certain to occur under the proposed development scenario from construction on through the long term.

Moreover, the development proposed will affect that zone as far as significant environmental impacts, through inevitable increases in pollution, impermeable surfaces (leading to more runoff), groundwater and surface water contamination, etc.

Finally, the cumulative impacts of the proposed development in the Hill Campus area -- particularly in light of concurrent projects such as the extensive new development proposed for UC Berkeley LRDP -- suggest that the overall magnitude of the impacts of the LRDP proposal may simply be too great for the City of Berkeley to absorb, and may be inappropriate for this area altogether. The EIR should consider location of some facilities in other areas as needed to reduce environmental impacts in and around LBNL.

Specifically, the proposed development presents the following concerns regarding biological and natural resources that the Sierra Club asks be fully studied and addressed in the EIR:

1) Habitat and Open Space Impacts

The proposed Hill Campus development will almost certainly result in a loss of open space, and of associated habitat and vegetation. The EIR should fully address this issue, including the potential impacts to Coast Live Oak woodlands and trees, which are specifically protected under the City of Berkeley zoning.

As with Coast Live Oaks, Strawberry Creek itself is protected under City of Berkeley ordinance (Chapter 17.08 Preservation and Restoration of Natural Watercourses). Any proposed development along the Strawberry Creek corridor should be analyzed primarily for ecological consequences but also to avoid conflict with related City of Berkeley ordinances. These ordinances reflect the desire of Berkeley citizens to protect the local and regional environments.

2) Sensitive and Endangered Species

The area is potential habitat for both Alameda Whipsnake and Red-Legged Frog (both endangered species), and the adjacent UC Berkeley Hill Campus zone falls within designated critical habitat for the Whipsnake. We ask that as part of the EIR full surveys be conducted across all seasons to ascertain the potential presence of sensitive species such as the Alameda Whipsnake and the Red-Legged Frog, in addition to any other potentially affected sensitive bird and plant species.

There are also regular, documented sightings of mountain lions -- a protected species in California -- within Strawberry Canyon and on Lawrence Berkeley National Laboratory property, not to mention their obvious (and documented) presence in the adjacent Tilden Park wildlife corridor. Again, we ask that the EIR fully address potential impacts to this species, and particularly the ramifications of the extensive research facilities proposed for the open space area.

3) Native Species and Other Habitat

Much of the land on lab property contains extensive communities of native vegetation, as well as important introduced species that are part of Berkeley's landscape design heritage. Remnant populations are often critical to the continued survival of species as a whole, while altered habitats can often provide essential refuge, foraging opportunities, and nesting habitat for a wide variety of species in urban areas which have no other habitat choices.

We ask that the EIR fully identify and analyze impacts to *all* open space and vegetated areas across the university lands in light of their potential importance as habitat, whether or not they are currently known to provide habitat for sensitive species. Certainly, any native species should be considered of vital importance to the long-term ecological health of the university lands, as should all vegetation along the Strawberry Creek riparian corridor.

4) Surface and Groundwater Integrity and Flows

The extent of development proposed suggests extensive significant impacts to surface water and groundwater quality both in the development zone itself, and downstream throughout the city of Berkeley, due to increased sedimentation, non-point source pollution, and possible toxics. Moreover, increases in impermeable surfaces due to intensification of development are likely to result in increased runoff and flooding, which will impact the entire watershed below.

The EIR must address the full range of water quality impacts listed above, including a full assessment of the feasibility of any proposed mitigation measures. This is particularly important in the case of non-point source pollution -- now noted as one of the biggest contributors to water quality impacts in the region -- because of the difficulty in identifying sources of such pollution in the first place. Moreover, given that the City of Berkeley's stormwater runoff infrastructure is already over-taxed, any additional strain on this system due to new development *must* be considered a significant impact and fully mitigated for by appropriate infrastructure enhancements based on a complete analysis.

The water quality and flow impacts must be analyzed in light of the upcoming, more stringent Regional Water Quality Control Board runoff control requirements, impacts to habitat (e.g., fisheries), and thresholds for regulated contaminants (e.g., diazinon). Moreover, all impacts must be analyzed with respect to the full range of other state and federal regulatory requirements.

The EIR must consider these impacts across the full timeframe of the proposed development, including the extensive impacts associated with the construction phases of projects, which can lead to massive sediment deposition in surface waterways. These impacts must be considered as well in light of the extensive cumulative impacts that will emanate from the combination of the LRDP with the extensive development concurrently proposed at UC Berkeley and that can be anticipated under the City of Berkeley's General Plan and Southside Plan.

5) Protection, Restoration, and Enhancement of Open Space, Habitat and Natural Resources

The LRDP completely fails to identify or discuss any possible opportunities for the protection, restoration, and enhancements of the significant natural resources present across the University-owned lands. It is unfortunate -- and disturbing -- that such a commitment is so noticeably absent in the University's long-range planning scheme. This suggests that environmental protection and restoration are an insignificant aspect of the University's planning approach. That absence simply flies in the face of the long history of concern for environmental protection expressed by the University itself, the Berkeley community and the San Francisco Bay area as a whole, and is a poor reflection of the educational values that LBNL seeks to promulgate.

Environmental protection and restoration are absolutely part of long term planning, and yet ot appears that the LRDP will virtually ignore this vital concern. We hope LBNL will rise to the occasion and recognize that environmental protection and stewardship must be given equal if not greater priority than research capacity and technological advancement.

C. Safety of Nano-technology

The Sierra Club would like to raise the following concerns and proposed mitigation measures relating to nano-technology:

1. LBNL should include a review of the potential environmental impacts of nano-technology as part of the EIR.

2. The LRDP should provide for an annual, independent, scientific review of the safety of the nano-technology research in an urban environment; the results of each such study should be made immediately available to the public.

3. All nano-technology research projects should undergo an independent process to assess health and safety issues before being allowed to proceed.

4. As a mitigation measure, if nano-technology is found to be at all unsafe or hazardous to the public, projects must be discontinued. Using all available precautions, nano-technology research must be designed to not impact air quality, water quality, or any other environmental resource.

Such mitigation measures are necessary for the EIR to adequately take into account potentially unsafe aspects of nano-technology. Care must of course be exercised in the application of any technology, but it is the Club's strongly held view that the Precautionary Principle must be adhered to with regard to new and potentially hazardous technologies such as nano-technology.

From: City Council member Dona Spring
981-7140 dspring@ci.berkeley.ca.us
2180 Milvia, Berkeley 94704

Comments on Lawrence Berkeley National Laboratories 's LRDP environmental review:

1. The project is ill defined except in square footage and locations, and therefore it is impossible to adequately assess the environmental impacts.

2. The previous LBNL LRDP was exceeded in square footage and project/building development. The new environmental review should give an accounting of all the ways that the previous LRPD was exceeded.

3. The city is not obligated nor can it afford to provide LBNL with free infrastructure support. The city needs to be adequately compensated for previous development before LBNL chooses to add any further development. Cambridge University pays the City of Boston in lieu payments of $20 million annually. The City of Berkeley deserves no less. The LBNL as well at the University of California must pay for pay its share of the infrastructure costs including sewers, storm drains, sidewalks and street construction and maintenance, street lighting, and landscaping maintenance. If the LBNL and the University of California had been adequately compensating the city in the past decade, the city would not have such a heavy back up of a billion dollars of deferred maintenance on sewers, storm drains, sidewalks and street construction. The billions of dollars of deferred maintenance jeopardizes the future sustainability the residents and businesses currently paying taxes. The environmental review should look as fiscal impacts of current and proposed new development for city services, including compensation for police services.

4. LBNL and the University of California must not remove through either rental or purchase any more properties from the tax rolls in Berkeley, which will further diminish the city's ability to generate revenue to provide basic services.

5) The LB NL proposal to develop 800 parking spaces is not environmentally sustainable Any additional growth by LBNL should be accomplished without increasing employee parking.

6). Give detailed information about the projected increases in animal experimentation and animal experimentation facilities for all of LBNL past and present.

7. LBNL needs to look at alternatives to expansion in Berkeley. The alternatives presented in the initial EIR are not realistic. There is a failure to adequately provide for alternatives.

8) LBNL needs to provide more open space for the community in compensation for its intense development.

9. LBNL should follow the standard set by other governmental institutions by compensating the City of Berkeley 10 percent of the cost of each project in addition to annual in lieu payments.

10. The LBNL currently contributes to significant traffic congestion on most of the major transportation arteries in the city of Berkeley. The university needs to reduce the automobile trips its employees and student generate before adding new development that will exceed the traffic capacity of the cities streets.

11. Expansion into Strawberry Canyon is an ecological disaster waiting to happen. This is on an earthquake fault in a high fire hazard area. Covering more of the soil will create run-off problems. This area is a riparian habitat area with oaks, creeks and the endangered whip snake. What will be the cumulative effect of all development in this area on wildlife habitat?

12. Lawrence Berkeley National Laboratories has failed to adequately consider the cumulative impacts of its development with UCB projected new development.

Endorse the comments of Janice Thomas, President of the Panoramic Neighborhood Association:

Subject:
proposed scope of analysis for LRDP's EIR
From:
JThomas621@aol.com
Date:
Tue, 25 Nov 2003 02:26:16 -0500 (EST)
To:
lrdp-eir@lbl.gov

J a n i c e   T h o m a s
37 Mosswood Road
Berkeley, CA 94704

November 23, 2003

Jeff Philliber
Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90K
Berkeley, CA 94720

Re: Proposed scope of analysis for LBNL's 2004 LRDP EIR

Dear Mr. Philliber,

I would like to add these comments to those I already made during the public scoping session. Thank you for the opportunity, as I was not notified of the 1987 LRDP scoping process or EIR.

First, I am writing to request increased specificity of the project location in the EIR analysis. The photographs that were displayed in the Scoping Session are a good start. But even so, no project location would be complete without providing actual measurements of aerial distance from the Laboratory boundaries to residential neighborhoods, student housing, intercollegiate athletic fields, the Strawberry Canyon Recreation Area, and the UC Botanical Gardens. This would be an improvement over the consistently vague and frequently misleading descriptions of project locations that have characterized past environmental review documents.

I am also writing to request an estimate of the amount of light generated at night by the proposed and existing buildings. There might be impacts to wildlife and a reduced ability to star gaze depending on the amount of light that is generated.

I appreciate the data already provided in terms of the number of gross square feet (gsf) that will be built. For example, I understand that the Berkeley Lab currently occupies 1,760,000 gsf in the Hill Area and that space demands will increase by up to 800,000 gsf. However, in terms of evaluating the impacts to the area, it would be helpful to know the percentage of the entire site that this figure represents. Asked another way, how much land remains undeveloped? And of this land, how much will provide suitable habitat for wildlife?

In a similar vein, what are the project goals for cleanup of soil and water? What percentage of the contamination will be cleaned and to what standard will the contaminated soil and groundwater be cleaned? These are basic and fundamental questions that need to be addressed in order to evaluate whether or not the LBNL is inappropriately building out in the perimeter of the site when in-fill development would be more appropriate.

The Hill Area Campus of the LBNL is prime real estate. The value of the real estate is not only the view, and the lush canyon environment, but also the proximity to the UC Berkeley Central Campus. The scope of the EIR analysis should include alternative locations for the research laboratories in order to preserve the Hill Area Campus for other uses and for which there may be no viable substitutes. Since the Lab's research does not reportedly cause human disease and since it is not classified, there would appear to be no reason to remain in the Hill Area. It could be anywhere assuming real estate is available. The scope of the EIR should therefore identify existing off-site locations, e.g. Emeryville, and systematically evaluate the costs and benefits of building new facilities in areas other than the Hill. Since student housing might be a better use of the land, the alternative site issue should be studied carefully. Otherwise it would appear that the Lawrence Berkeley National Laboratory operates at its current location for its view and out of tradition rather than rethinking the appropriateness of pursuing the Lab's mission at this location until the year 2025.

The LBNL has been irresponsible in the past for not developing a Watershed Management Plan. The Central Campus of UC Berkeley has had a Watershed Management Plan, but the Lab and UCB have failed to develop a plan for the headwaters. This is all the more troubling because of the Lab's hillside location, and the fundamental principle of water flowing downstream and seeking its lowest level. The tritium-contaminated groundwater, which was recently reported to the public by the Department of Toxic Substances Control, is an example of the Lab's historic failure in this regard. The faults and landslides combined with tritium-contaminated groundwater raise serious concerns that have not been heretofore addressed. The fact that the Lab's site is only 200 acres of the whole area and that UCB has joint custody, so to speak, is not an excuse. The Lab has arguably generated far more pollutants than UCB in the Hill Area and will undoubtedly continue to generate far more pollutants than UCB in the Hill

Area and therefore should assume some leadership and moral authority in this regard. Please let this LRDP be the catalyst for doing so now.

Recreational impacts should be considered in this EIR. If the Lab is not conducting classified research and if there are no negative health impacts, then the Campus should be more available to the public for walking and hiking. This is especially true since UCB's fire trails are open to the public. The reasons for excluding the public from LBNL's fire trails should be provided.

Noise impacts were inadequately estimated in the Molecular Foundry Initial Study. A sample of three different houses was used to generalize to the noise effects on all the houses on the Strawberry Canyon side of Panoramic Hill. The topography of the hill and the singular location of each home make generalizations faulty when based on just a few houses. The canyon acoustics do not allow noise to dissipate, and instead, the hillside catches the sound. As an example of this phenomenon, I can testify to hearing trains' whistles despite being miles away. In the LRDP, the canyon acoustics need to be factored into the noise analysis, and the methodology for predicting noise impacts needs to be valid. Data derived from flat terrain is useless as a predictor of noise impacts in the canyon.

The aesthetic impacts concern me greatly. As it is at present, the LBNL site is mostly out of site in Strawberry Canyon except from the perspective or Panoramic Hill residents such as myself. The verdant area of Strawberry Canyon is one of the characteristics of Berkeley and defines the Berkeley Hills compared to other hill towns. This area should be preserved for its distinctive aesthetic features that moreover have cultural significance and meaning not the least of which is Frederick Law Olmstead's vision to keep the canyon as open space. The canyon has significance as a cultural amenity that has not been adequately identified as such.

Yours sincerely,

Janice Thomas

Committee to Minimize Toxic Waste

Jeff Philliber
Environmental Planning Coordinator
Lawrence Berkeley National Laboratory
MS 90K - One Cyclotron Road
Berkeley, CA 94720

November 25, 2003

Re: Comments on the Revised Notice Of Preparation (NOP) for the Draft Environmental Impact Report (DEIR), LBNL 2004 Long Range Development Plan (LRDP)

Dear Mr. Philliber,

The City of Berkeley had requested a 14 day extension to the comment period for the above mentioned LBNL 2004 LRDP NOP for these reasons: "Given the existence in the project area of locations identified as Hazardous Waste and Substances sites, the proximity of the facility to a major fault line, and its location in an area that is susceptible to wildland fires and seismic-induced landslides, it is particularly important that the City and other agencies have adequate time to list issues that must be addressed in the Draft EIR." (Attachment 1)

The Laboratory has refused to grant the City's request.

This is the first time in 15 years that the community has an opportunity to comment on the Department of Energy's (DOE) oldest nuclear industrial complex LBNL's Long Range Development Plan/through the year 2025. Clearly more time should have been granted for this enormous task of compiling a comprehensive list of issues related to LBNL's proposed land use plans that need to be addressed in a clear, truthful, detailed manner in the upcoming DEIR.

Due to the lack of time, we are enclosing comments on specific issues that we have raised during this year with respect to several LBNL related projects such as the Molecular Foundry, Building 49, RCRA Corrective Action Process and DOE's proposed risk based "cleanup" of its sites. All these issues are relevant to the LBNL 2004 LRDP EIR process, and must be addressed in a comprehensive way.

The enormity of LBNL's expansion is defined on page 8 of the NOP, which states that "LBNL occupies 1,760,00 gsf at the main Hill site" and that the "implementation of the 2004 LRDP would increase the Lab's main Hill site building area to 2,980,000 gsf", i.e. an increase of 1,220, 000 gsf building area in the already fragile natural area of the Strawberry Creek Watershed.

One and a quarter million square feet translates to 70% increase in the Lab's Hill site building area and corresponds to approximately 18 or 19 six story buildings, the size of the proposed Building 49, a project, which review was rushed through just weeks before the Lab's announcement for the LRDP EIR process.

A similar rush-through occurred just some 6 months earlier with the ever controversial Molecular Foundry project, this time without an EIR, skirting the public process. (Attachment 2)

We had asked in our comment letter of October 31, 2003, that the Lab postpone the B49 EIR until the LBNL 2004 LRDP EIR is finalized, so that the project impacts can be adequately addressed and mitigated, not based on a 15 year old EIR, but one currently in preparation reflecting the present and future development at the site. (Attachment 3)

To continue in that spirit we are asking that LBNL include a project level environmental analysis of the Molecular Foundry as part of the LBNL 2004 LRDP EIR, as the University of California Berkeley (UCB) has done with the Chang-Lin Tien Center under the UCB LRDP ! Specific concern here are the impacts of construction to the Chicken Creek sub-watershed which includes No Name and Chicken Creeks and a historical spring, as well as the impacts of the operations of the Molecular Foundry, namely nonopollution, i.e. ultra fine particle emissions on human health and the environment.

Attached is the recommendation by Berkeley's Environmental Commission on November 6, 2003 addressing these very issues, which we ask you to consider in the LRDP EIR. (Attachment 4)

In addition to the attachments above we are enclosing the following documents (and their relevant attachments) for you review and consider and respond to in the LBNL 2004 LRDP EIR:

1. February 4, 2003 comments re: Molecular Foundry (which include comments to DOE re: Risk Based Cleanup, dated January 30, 2003) (Attachment 5)

2. April 17, 2003 Molecular Foundry comments addressed to the UC Regents (Attachment 6)

3. Urban Creeks Council of California comments on the Molecular Foundry, dated May 15, 2003 and addressed to the UC Regents (Attachment 7)

4. CMTW's questions to LBNL re: Molecular Foundry (Attachment 8) dated May 8, 2003

5. June 20, 2003 letter addressed to the Department of Toxic Substances Control re: RCRA Corrective Action process at LBNL (Attachment 9) Also attached is a June 24, 2003 request for RCRA related LBNL documents and contour map of LBNL with specific GIS layers

6. Comments on B49, dated July 17, 2003, September 3, 2003 and October 31, 2003 (Attachment 10)

7. October 9, 2003 comments on UCB's LRDP including a letter dated 3/13/03 re: LBNL (Attachment 11)

In summary we are asking that the LBNL 2004 LRDP address in a comprehensive way all the issues raised in the above referenced documents i.e.

1. Geologic hazards, modelling of all known faults (active and inactive) and their splays at LBNL and in the Strawberry Canyon area

2. Soil liquefaction potential along creeks

3. Historical landslides and soil failings at LBNL and in the vicinity in the Strawberry Canyon

4. Comprehensive watershed analysis including study of the Lennert Aquifer (a water bank)

5. Comprehensive watershed management plan, which would correctly characterize the tributaries of Strawberry Creek as Mediterranean Streams with their own specific habitats (Attachment 12)

6. Provide comprehensive surface and subsurface geologic information for the entire LBNL site in order to model groundwater transport relative to contaminant and water quality concerns

7. Provide a long term clean up plan for all toxic contaminants

8. Provide a long term decommissioning plan for the many lab buildings currently vacant or extremely unused, due to existing contamination

9. Comprehensive analysis of a new threat, nanopollution (Attachment 13)

10. Comprehensive analysis of the impacts of the Advanced Light Source, used in connection with the Molecular Foundry projects, as to increased risks from gamma and neutron radiation on the residential neighborhoods of the Panoramic Hill's north side

11. Comprehensive analysis of fire risks, due to the Lab's location in a high risk critical fire zone

12. Comprehensive evacuation plans for the residents surrounding the Lab to the north and south, site maps should show all the surrounding neighborhoods at least to the distance of 2 miles in all directions

In conclusion, there is a lot of mistrust in the community regarding LBNL's willingness and ability to manage and control toxic, radioactive pollution from the existing facilities. The evidence is in the multiple contaminated groundwater plumes, in the radioactive vegetation, tritium contaminated Eucalyptus grove offsite next to the Lawrence Hall of Science, a children's museum and school. (Attachments 14 and 15)

In newspapers we see articles with headlines such as: "Berkeley lab found research fabricated (SF Chronicle, 7/13/'02), LBNL finds accounting to be sloppy (Berkeley Voice, 10/3/'03), Berkeley Lab poses health risk, fire could release dangerous radioactivity (SF Chronicle 2/6/'01) which do not increase the community's confidence in the Lab's management practices, especially in the areas of Environment, Health and Safety, for which there should be a comprehensive, independent audit. (Attachment 16)

We believe that the only acceptable alternative for the Lab is to stop growth in the Strawberry Creek Watershed and start satellite/second campus development offsite in order to protect and preserve the last pristine areas of the Strawberry Canyon for future generations .

Sincerely, [signature]

Pamela Sihvola
P.O. Box 9646
Berkeley, CA 94709

PS. Enclosed also please find the Berkeley City Council's unanimous Resolution, passed on Tuesday, November 25, 2003 re: LBNL's LRDP (Attachment 17). Also 4 articles in the Daily Planet (Attachment 18)

November 25, 2003

Mr. Jeff Philliber, Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory,
One Cyclotron Road, MS 90K, Berkeley, CA 94720.

Dear Mr. Philliber, RE: Proposed Scope of Analysis for LBNL's 2004 LRDP EIR

After reading the Proposed Scope of Analysis for LBNL's 2004 LRDP EIR stage of the plan making process which anticipates development for the next 20 years at the Lawrence Berkeley Lab, I have a number of questions and comments I think should be included in the 2004 SCOPE documentation to serve as a baseline for 20 years hence.

I. I was unable to find a solid reference to the 1987 Plan (plus add-ons) with respect to building on the strengths, filling gaps, and otherwise improving upon that Plan's weaknesses. This raises the question of what does the current planning community mean by "SCOPE" in 2003, and how has that changed from 1987? Did the Scoping in the 1987 LRDP included fewer characteristics to evaluate than LRDP Scoping does in 2003?

One could argue that in 2003 there is increasing environmental awareness as well as awareness of environmental illness such as radiation sickness and lead poisoning. One could argue that there is increasing awareness of infrastructure weaknesses such as seismically damaged sanitary sewer and storm drain utilities underground of the Lab that we know are leaking toxins into the groundwater and likely will end up in Strawberry Creek and its tribulets. One could argue we are more aware of the preservation of natural habitats in the wild lands the Lab rents from UC than before, which would likely be damaged by even more development of any sort.

II. Perhaps, it would be wiser "to clean house", fix up the infrastructure and reallocate existing facilities of unused space before sprawling into outlying areas of pristine land? Can you clarify the mixed signals we have received this month in the Scoping phase of the planning, with respect to current planning state-of-the-art-thinking on urban sprawl construction into outlying pristine environmental land, versus the alternative of infill planned construction in the heart of the built clusters at LBNL?

III. And in the face of the Bay Area region's projected growth, at this time of budget shortfalls, wouldn't it be smart to use a **sustainable development model** for planning facilities in careful detail with respect to costs and benefits by revitalizing existing buildings which already have stable soil sites and even have utility hookups?

IV. In the case that the Lab will no longer occupy the Berkeley sites, one could imagine those facilities prepared for potential educational use within the University's mission of education, research, and community service.

Isn't scoping about applying currently adopted policy under law--a set of principles that evolves over time? Therefore, if the time line is until 2020, then current planning must evaluate the flow that goes back--as well as forward, rather than be stuck in a static land use notion that appears to be one of urban sprawl taking of more and more pristine land in outlying areas that could instead be protected to sustain our lives with cleaner air, water and soils?

I would plan differently. Perhaps you have another two plans that have not been shared with the public?

I would imagine:

Plan A for Future Development as one imagines the Lab Stays forever

Plan B if the lab goes--then convert to educational facilities

Plan C if the lab stays for only the next contract period

As I understand it, the LBL is portrayed as the brainchild of the 3 Labs under the University of California contract with DOE. The Lab conducts threshold research where theoretical one-off design models are invented and then go to industry for the appropriate applied testing. Now, the future of the location of the Lab is in question. At the May 15, 2003 Board of U C Regents Meeting former President Atkinnson and Ambassador Linton Brooks (the current Director of the National Nuclear Safety Administration), brought into the open that the DOE is requesting the University administration to competitively bid on the next contract. The discussion covered the possibility of the Lab leaving Berkeley and going to the University of Texas or elsewhere. Either the contract will be renewed or the contract will be cancelled. The continuation of the DOE Lawrence Berkeley National Laboratory under the present arrangement at the Berkeley/Oakland site on University land will be no more.

In national politics dominated by a Republican administration, Republican Senate and House majorities in Washington DC, there is less support for the dominantly Democratic Party San Francisco Bay Area economy, and the University of California Systemwide. Contrast this with much support to contract with research centers and universities in Texas. Such a shaky future bears enormous implications, not only for the University's budget, but also for the entire Bay Area economy.

V. Pivotal questions that are being discussed far and wide are not at all addressed in the LRDP 2004 initial study. In my experience working for a County Supervisor in the 1970's, these questions would normally fall within the scope of modern planning. To begin, a few are:

What projects would leave with the Lab contract?

What scientists and support staff would leave?

What offices and building would be vacated? What is the projected number of gross square feet (gsf)?

What percentage of the average daily population would no longer be driving to the Lab?

Would the bus service leave and no longer transport faculty and staff to the present stops?

Would the Lab take moral authority and complete the designated clean up of the toxic 'stains' from chemical and radioactive waste in the groundwater, soils, creeks, and vegetation before it closed down?

Or, would the University be left with the toxins problem that has been accumulating for 60 years?

To what degree would that cleanup extend: to a zero tolerance of a full clean up level as requested by the City of Berkeley?

Or, would the clean up be ignored, as is the tendency on many former military bases?

Or as knowledgeable community members fear, will we be mind-boggled with the public relations outbursts to control public outrage?

VI. A CONPREHENSIVE ALTERNATIVE ANALYSIS to revisit the two planned projects, Building 49 and the Molecular Foundry of 2003 that somehow escaped the current planning that you opened in 2000.

One could argue that the concept and plan for the Molecular Foundry is not unique, it is DUPLICATIVE of other MF' under DOE in other parts of the country and therefore is an "extra"one. Those other sites have buffer zone perimeters, which safeguard the laboratories, while this proposed building site in the Strawberry Canyon Watershed does not. To my knowledge those other foundries do not have to consider firestorms, earthquakes, and landslides and are not located in an area at high risk for terrorism under the Homeland Security designation. A full EIR with public imput would have given you details on these issues to answer to. Please revisit these considerations; these projects belong to the land base and therefore are within the scope.

VII. What follows is taken from a letter that I sent to Senators Boxer and Feinstein in October 2003 expressing my opposition to the Nanotechnology Molecular Foundry appropriation for LBL's Berkeley Campus after the project was certified by the Regents.

"On the Energy and Water Bill conferencing, please consider eliminating the funding for MOLECULAR FOUNDRY for the Lawrence Berkeley National Laboratory and setting a MORATORIUM on the project until we have a thorough discussion about the health and environmental implications of molecular nanotechnology. We should also have a firm and grounded understanding of any associated hazards, likelihood of accidents, and whether it should be sited in a secure area away from densely populated areas...

Nowhere is this facility PROPOSED AS EDUCATIONAL for a university community...

The scientific community knows very little about the health and environmental impacts of molecular nanotechnology.

On July 8, 2003, the US EPA, through its National Center of Environmental Research, released a Request for Applications entitled "Impacts of Manufactured Nanomaterials on Human Health and the Environment" in which it states "There is a serious lack of information about the human health and environmental implications of manufactured nanomaterials, e.g., nanoparticles, nanotubes, nanowires, fullerene derivatives, and other nanoscale materials.

Table 1 provides an outline of nanostructures, their size, and material into which they may be formed, indicating the type of application in which they may be used. Environmental and other safety concerns about nanotechnology have been raised (Dagani, 2003; Masciangoli and Zhang, 2003; Service, 2003). As part of EPA's mission to protect human health and the environment, this solicitation requests research proposals which address potential health and environmental concerns of nanomaterials." See, http://es.epa.gov/ncer/rfa/current/2003_nano.html for the full document.

Given our lack of knowledge about the potential health and environmental effects of this new and untested technology, should we not ensure that it would do no harm? Should we not wait until we, the public, are satisfied that scientific due diligence has been conducted and no harm to life and the environment is shown before this technology is released upon the world?

Here are other reasons that funding and building the Berkeley/Oakland facility is inappropriate:

The proposed Foundry is duplicative—the National Nanotechnology Initiative lists several other Foundries with the very much the same research plans.

All of those foundries are at SECURE sites; LBNL has no buffer security perimeter to protect nearby classrooms and homes

Nowhere is this facility PROPOSED AS EDUCATIONAL for a university community...

It is advertised as a user facility where "...what could you make if you could build things atom-by atom?"

And "...to develop and study both "soft" (biological and polymer) and "hard" (inorganic and fabricated) nanostructures and how they can be assembled."*

Any facility that creates experimental human, animal, and plant life forms (biological life) then destroys that life in thousands of trials, raises again the issue of when does life originate and who has the right to destroy each life? This is troubling for theological thinkers. Just imagine the implication of this?

Thank you for your kind attention,

Very truly yours,

JENNIFER MARY PEARSON

Jennifer Mary Pearson, Ph.D.,
Berkeley, Ca 94709

* From: "Berkeley Lab A Place of Wonder"

November 23, 2003

Dear Mr. Philliber,

We are writing you regarding our concern for the massive expansion/development of the Lawrence Berkeley Nat'l Laboratory in Strawberry Canyon. As very frequent users of the fire trail which winds its way from the "trail head" off Centennial Drive to the gate at Grizzely Peak Road its become increasingly distressing to watch large areas of the hillside vegetation being transformed into high tech research facilities and paved roads/parking lots. In addition healthy trees are continuing to be cut down, or arbitrarily "pruned" drastically along the fire trail.

For those of us who live here in town Strawberry Canyon (there probably is a formal name for this trail) is an irreplaceable resource that needs to be protected and preserved for ourselves + future generations. In such a densely populated urban setting the LBNL might do well to consider addressing its Hazard Ranking Score of 50.35, qualifying it a Superfund site... unfortunately there is no longer any funds for such clean-ups so local expertise might want to turn their focus there for awhile.

In developing "your" 20 year development plan please recognize you're a part of this community, and consequently should be respectful of what a tremendous jewel this canyon is to us, as well as the numerous wild life which inhabit the scant remaining area that continues undisturbed.

Please keep us informed as to LBNL's plans for work in the community, and Strawberry Canyon specifically.

Sincerely,

Jim Mullins & Joan E Baylie

Jim Mullins   Joan E. Baylie

1478 Rose Street, Berkeley 94702

from TOM ATLEE, COINTELLIGENCE INSTITUTE - address at end

Below is a third article from Rachel's Environment and Health News describing the problems of nanotechnology. This one covers an aspect I didn't even know about -- nanotechnology's direct threat to individual health.

I have spoken with Senator Wyden's office. I was told that the Senate nanotechnology bill S.189 has not yet gotten out to a vote -- but will soon. I was told that Senator Wyden (it's chief sponsor) is trying to get language in the bill that advocates citizen deliberation about nanotechnology. The staffer said what they most need is not phone calls but letters they can show to the other Senators demanding citizen deliberation be in the bill. Due to security-based mail slow-downs in Washington DC, she said that emails would be most useful.

So I urge you to write to Oregon's Senator Ron Wyden and then send a copy to your own Representative and/or Senators, since they'll be involved in voting on the final legislation. I've enclosed my own letter below for your info. As I wrote in my last email on this subject, "Tell them you want strong language in that bill MANDATING frequent citizen panels and consensus conferences, in which randomly selected citizens learn about nanotechnology and interview experts, deliberate and then let businesses, government, media and the public know what research and development they think is safe, wise and desirable to pursue -- and what research and development they want to hold off on. Tell them that none of us want the fiascos of nuclear technology and biotechnology where development raced ahead of what was wise, so that now businesses, governments and citizens face some real messes. If they want to create sustainable jobs with nanotechnology, make sure those jobs are doing things that well-informed people want to have done. Senator Wyden has a good track record on listening to the people's voice. He needs to apply that to nanotechnology."

If you are an American citizen, you can email your representatives via <http://www.congress.org>. Just type in your zip code and the site will take you to a link to your representatives' email. Most members of Congress will only receive email correspondence submitted through a web form, rather than directly, and Congress.org delivers the forms you need. In your letter to your Senator, you may want to include more information on nanotechnology than I put in my letter to Wyden, since, as the originator of the nanotechnology bill, Senator George Allen (R-VA), said, "no more than 5% of senators or their staffs [even] know what nanotechnology is." http://www.aip.org/enews/fyi/2003/038.html

I had an interesting insight while thinking about my own letter: I realized that these issues become clearer when seen through the lens of cost/benefit dynamics.
* Exploitation can be viewed as "I get the benefits and you get the costs" or "We get the benefits and we ignore the cost to others."
* Debate can be seen as each side promoting the benefits of their views while stressing the costs of their opponents' views -- whereas

* deliberation can be viewed a full exploration of costs and benefits with an effort to find options that have the most benefits and least costs for all involved.
* We'd have a more wise and prudent culture if we empowered dialogue and deliberation among diverse views so that costs and benefits associated with social issues were always being well explored so that more wholly benefical options could be routinely chosen.

As you'll see in my letter to Wyden, this lens also provides an interesting view of our corporate system.

So I invite you to join this effort by writing a letter or two. As a popular folk song goes, "Inch by inch, row by row, we're gonna make this garden grow."

Tom _ _ _ _ _

My letter to Senator Wyden (sent also to my other Senator and Congressman)

****

Dear Senator Wyden,

It is very important that the Senate nanotechnology bill S. 189 have strong language mandating -- or at the very least strongly endorsing -- official citizen deliberation (such as citizen panels and consensus conferences) to evaluate nanotechnology on a frequent basis. Given the speed of nanotechnology's development, it would be both wise and practical to hold official citizen deliberations at the national level every 6-12 months. Please ensure that language to this effect exists before the bill is brought to a vote.

You know the advantages of nanotech -- the medical miracles, the pollution solutions, the jobs. That's why you sponsored this bill. But nanotech has potential downsides, as well, ranging from increased respiratory disease to vast environmental destruction.* It would be imprudent, to say the least, to pursue the benefits without attending to the risks and costs.

In our political-economic system mass media, collective decision-making and jobs are all tied to the corporate bottom line. This system naturally produces more profits than prudence. Pursuit of profit causes advertising to trumpet the benefits of products while downplaying their costs and risks. And many industries are powerful enough to get government to help them "externalize" their costs and risks so that taxpayers, other countries, nature, or future generations pay the costs.

A free market can only remain free and safe if it is supervised. Without democratic oversight of corporate activity, we cannot safely pursue the benefits of technology development. Past failures of democratic oversight are already leading us into what has been rightly called an Age of Consequences.

You, as representative of the common interests, need to ensure that new developments in profitable technologies are monitored by comparably powerful democratic oversight. This includes review by Congress and independent experts. But most importantly it must includes review by randomly selected citizens who can be educated about the risks and possible benefits of a technology and then deliberate to render trustworthy public judgment.* This capacity of ordinary citizens has been proven by decades of experience with consensus councils and other citizen panels.*

Our nation didn't take this path when it launched the development of nuclear technology and biotechnology. The glowing promises of these technologies were foisted upon the American public without adequate public deliberation. Now we are faced in both industries with unprofitable messes, mired in public backlash, expensive subsidies and waste storage problems, and the threat of accidents and misuse by terrorists.. Nanotechnology will end up similarly problematic if it flashes ahead without due deliberation by a public more interested in prudence than profit.

You have a record of supporting the public good, a healthy environment, the welfare of future generations, and public participation. Please apply these criteria to this extremely delicate issue. Give We the People a chance to judge for ourselves and our society whether the benefits offered us by nanotechnology outweigh its risks and costs. Anything less is not truly democratic.

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* REFERENCES:

Re nanotechnology see http://www.rachel.org
Re citizen deliberation see http://www.co-intelligence.org/CIPol_publicjudgment.html
Re consensus councils and citizen panels see http://www.co-intelligence.org/P-CDCs.html

For further information on these and other issues related to enhancing our democracy see the Co-Intelligence Institute's websites: co-intelligence.org, democracyinnovations.org and taoofdemocracy.org
And here's the Rachel's article

=====================Electronic Edition=====================

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. RACHEL'S ENVIRONMENT & HEALTH NEWS #774 .
. ---July 24, 2003--- .
. (Published September 4, 2003) .
. HEADLINES: .
. THE REVOLUTION, PT. 3: ULTRAFINES .

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THE REVOLUTION, PT. 3: ULTRAFINES

A revolution is sweeping through science and technology, blending cognitive science (how the brain works), biotechnology (manipulation of genes), information technology, and nanotechnology, or nanotech for short. The engineers who are masterminding this revolution explain that it is "essential to the future of humanity"[1, pg. 22] because it holds the promise of "world peace, universal prosperity, and evolution to a higher level of compassion and accomplishment."[1, pg. 6] They say it may be "a watershed in history to rank with the invention of agriculture and the Industrial Revolution."[1, pg. 20] The ultimate aim of the revolution is not so new: the "conquest of nature." [1, pg. 80]

The revolution is driven by the convergence of four technologies (nano, bio, info, cogno), but here we focus again on only one of the four -- nanotech -- because it is becoming the foundation stone of bio and info sciences,[1, pg. 71] because it has been largely ignored by the media, and because it is galloping forward at breakneck speed. It is no exaggeration to say that the field of nanotech is gripped by a "gold rush" mentality. Any day of the week, take a look at http://nanotech-now.com/ to catch a glimpse of the gold rush in action.

Nanotech is named for the nanometer, a unit of measure, a billionth of a meter, one one-thousandth of a micrometer. The Oxford English Dictionary defines nanotechnology as "the branch of technology that deals with dimensions and tolerances of less than 100 nanometres, esp. the manipulation of individual atoms and molecules."

In 2000, President Clinton created the National Nanotech Initiative, which is now funded at the level of $700 million per year -- the third largest public research program in the U.S., after the war on cancer and the star wars missile defense program. (See Rachel's #772 and #773.) In every state in the U.S., nanotech proponents are commandeering tax dollars to subsidize "the next big thing." Many states are hoping to establish their own "Nano Valley" as an entrepreneurial wild west modeled on Silicon Valley before the bubble burst.

In March of this year, Small Times magazine said the states with the greatest nanotech potential are California, Massachusetts, New Mexico, Arizona, Texas, Maryland, New York, Illinois, Michigan and Pennsylvania, with Colorado, New Jersey, North Carolina, Ohio, Virginia, and Washington state close behind.[2] The National Science Foundation predicts that nanotech will be a trillion-dollar industry by 2015, just 12 years from now.[2] Nanotech is advancing upon us at warp speed.

This week we will focus on only one aspect of nanotech: the environmental and human health effects of nano particles, which are particles 100 nanometers (0.1 micrometers) or less in diameter. As we saw in Rachel's #772, the intentional manufacture of nano particles is already under way, and this new industry is gearing up worldwide. Nano particles go by different names, such as nanodots, nanotubes, buckyballs, and buckminsterfullerenes, among others.

According to the Etc Group, which follows nanotech developments carefully, an estimated 140 companies are now producing nano particles in powders, sprays, and coatings that are being used in a variety of products, including sunscreens, automobile parts, tennis rackets, scratch-proof eye glasses, stain-repellent fabrics, self-cleaning windows, and more.[3, pg. 2] Mitsubishi Chemical in Japan has reportedly begun construction of a plant to manufacture nanotubes at the rate of 120 tons per year, with plans to increase output to 1500 tons per year by 2007.[4] The U.S. government's space agency, NASA, plans to spend the next five years scaling up the production of nanotubes. [1, pg. 50]

One of the most important characteristics of nano particles is their huge surface-to-volume ratio. The smaller something is, the larger its surface area is, in comparison to its volume. Because nano particles are so small, they have an enormous surface area, relative to their volume. Drug companies are planning to take advantage of those large surfaces -- for example, covering nano particles with drugs for targeted delivery into the interiors of our cells. The smaller the size of the particle, the larger the load of drugs it can carry (larger, relative to the particle's volume).

Unfortunately, the large surface area of tiny particles also makes them dangerous for at least two reasons: first, the large surfaces alone promote the reaction of oxygen with human (or animal) tissue, creating free radicals.

"Free radicals are atoms or groups of atoms with an odd (unpaired) number of electrons and can be formed when oxygen interacts with certain molecules. Once formed these highly reactive radicals can start a chain reaction, like dominoes. Their chief danger comes from the damage they can do when they react with important cellular components such as DNA, or the cell membrane [the cell's outer casing]. Cells may function poorly or die if this occurs," explains Dr. Mark Jenkins at Rice University. [5]

In sum, the large surface of nano particles offers an ideal place which oxygen reactions can occur in the airways and lungs, resulting in the formation of free radicals with subsequent cell damage or cell death, followed by inflammation.

The second danger from nano particles arises when they float freely in the air, where their large surface area provides a sticky place where metals and hydrocarbons attach themselves. The smaller the size of the particle, the larger the load of metals and hydrocarbons it can carry (larger, relative to the particle's volume).

What do we know about health effects of nano particles?

It turns out that we already have a fair amount of data on the dangers of airborne nano particles -- but researchers don't call them nano particles. They call them ultrafines. Nano particles and ultrafines are the same thing -- particles with an average diameter of 100 nanometers (0.1 micrometers) or less.

Scientists have known for more than a decade that fine and ultrafine particles in the air create haze and kill large numbers of humans. Fines and ultrafines are produced by fossil-fuel power plants, incinerators, cement kilns, and diesel engines, among other sources. As early as 1991, Dr. Joel Schwartz of U.S. Environmental Protection Agency (now at

Harvard) estimated that fine particles were killing 60,000 people each year in the U.S. That shocking estimate has since been confirmed and reconfirmed and is now widely accepted.[6] Fine particles are defined as those with a diameter of 10,000 nanometers (10 micrometers) or less. Ultrafines are 100 times smaller than fines.[6]

Today, researchers are examining the properties of ultrafines and there seems to be little doubt that they are the major killers in haze. Studies in Los Angeles, California reveal that ultrafines are 10 to 50 times as damaging to lung tissue, compared to larger fine particles.[7]

Since 1991, scientists have been wondering whether fine and ultrafine particles cause harm because of their size alone, or because they carry metals and hydrocarbons deep into the lung. Researchers today believe that, in the case of ultrafines, the answer is both.

U.S. Environmental Protection Agency refers to fines as PM 10 (short for "particulate matter 10 micrometers or less in diameter"). By 1996, EPA became convinced that PM 2.5 (particles with diameters of 2.5 micrometers [2500 nanometers] or less) were far more dangerous than PM 10, and the agency proposed rules to control PM 2.5 air pollution. Corporations immediately sued in court to "get government off our backs" and to fulfill their fiduciary duty to shareholders by every legal means, even though that duty in this instance entails killing tens of thousands of anonymous citizens each year. In 2001, after a 5-year court battle, EPA won in the U.S. Supreme Court, but the agency, chastened by corporate encounters, has shelved its plan for controlling PM 2.5 air pollution.[8]

Meanwhile, new studies are piling up showing that nano particles (ultrafines, which in EPA terminology would be PM 0.1) are by far the most dangerous of all.

EPA does not collect data on nano particles in any systematic way, and has announced no plans to control them. Meanwhile the nano particle corporations and NASA are ramping up industrial operations to manufacture ultrafines in ton quantities. It appears that the stage is being set for major new trouble and an escalation of the killing.

The picture continues to develop, but current research shows that nano particles in the lung cause the formation of free radicals, which in turn, cause lung disease, and cardiovascular disease. Furthermore, nano particles carry metals and carcinogenic hydrocarbons deep into the lung, where they exacerbate asthma and other serious breathing problems. In addition, nano particles combined with metals can pass directly into the brain where they promote the formation of waxy amyloid plaques, which are the signature feature of Alzheimer's disease.

In Fresno, Calif., Kent E. Pinkerton at Univ. of Calif. Davis found from autopsies that "outwardly robust people routinely harbor damage in their lungs' small airways, setting the stage for respiratory and cardiovascular disease." The bronchioles were scarred with fibrosis and an abnormal thickening, apparently caused by "the ravages of free radicals." [6,9]

Subsequent exposure of rats to ultrafine particles at levels found in Fresno on a bad day revealed many dead cells in the rats' lungs, large numbers of inflammatory cells (neutrophils), and destruction of macrophages -- which are cells that promote health by actively removing foreign material from the lungs.[10] In other words, ultrafines kill off the lung's natural defenses, then create their own unique form of damage, promoting free radicals, cell death, inflammation and eventually cardiovascular disease.

Pinkerton's findings were confirmed by a study of the lungs of non-smoking women in Mexico City and in Vancouver, British Columbia, which revealed extensive lung damage from exposure to dirty Mexico City air, but not clean Vancouver air. [4] The small airways of the Mexican women "were very abnormal," with fibrosis and thickening.

Researcher Ken Donaldson at the University of Edinborough in Scotland has studied particles of pure titanium dioxide and pure carbon. At 10 micrometers diameter, they cause no damage to rat lungs. But when they are crushed into ultrafines "they become highly inflammogenic to the lungs," he told Science News.[6, 12, 13] In other words, carbon nano particles, without any pollutants attached (no metals, no hydrocarbons), cause lung damage by themselves. Their size alone is harmful.

Donaldson conducted similar experiments on ultrafine particles of pure styrene, with similar results, showing that nano size alone is a danger. This clearly indicates that the manufacture of nano particles will be a threat to workers, and any particles released into outside air will be a public health menace. It is worth pointing out the obvious: The smaller particles become, the harder they are to control and contain.

Nano particles floating in the air will not remain pure for long. Metals and hydrocarbons (from combustion sources like incinerators, cement kilns, fossil-fuel power plants, and diesel engines) will quickly coat their large surfaces.

It is now known that the deadly effects of fine and ultrafine particles aren't restricted to the lung, but occur in the cardiovascular system and brain. Renaud Vincent and colleagues at Health Canada (the Canadian equivalent of the U.S. National Institutes of Health) clarified the mechanism of cardiovascular damage by exposing healthy volunteers to high levels of fine particles -- the levels you might find in a city with dirty air.[14, 15, 6]

Vincent found that exposure to ultrafine particles doubles the concentration of a small protein (called endothelin) in the blood stream. Endothelin increases blood pressure. The spike in endothelin levels can be tolerated by a healthy subject, but may kill a person who is already suffering from atherosclerosis (hardening of the arteries).[6]

Importantly, the spike in endothelin concentration only occurs when subjects are exposed to fine and ultrafine particles that have metals or hydrocarbons attached to them. If the particles are purified before the humans are exposed to them, they have no effect on endothelin levels. Thus it seems to be the combination of ultrafine particles and metals and/or hydrocarbons that increases endothelin.

Other researchers have also been examining the effects of fine and ultrafine particles on cardiovascular health. Scientists at the Harvard School of Public Health exposed dogs to fine and ultrafine particles, then simulated heart attacks in the dogs by using a surgically-implanted balloon to temporarily shut off a coronary artery. Dogs that had been breathing ultrafines could not compensate for the blocked artery -- which may help explain why humans who have heart attacks on a bad-air day are more likely to die than people having heart attacks where the air is cleaner.[16]

Cardiovascular disease and heart attacks are not the only concern arising from exposure to fine and ultrafine particles in the air. A University of North Carolina research team working with dogs living in Mexico City has shown that exposure to ultrafine air pollution causes brain damage. Lilian Calderon-Garcideunas found that ultrafine particles carry metals such as vanadium and nickel into the dogs' brains through their noses. The fine particles break down the barriers that normally prevent contaminants passing into the brain.[6, 17]

Dogs are often used as models for the study of cognitive impairments that accompany old age in humans. Some dogs aged 10 and over develop the waxy plaques that are characteristic of Alzheimer's disease. Calderon-Garcideunas's study of 200 dogs in Mexico City reveals that the animals breathing ultrafine particles develop waxy beta-amyloid plaques in the brain before they are a year old.[6, 17]

Calderon-Garcideunas told science writer Janet Raloff that her findings are "definitely worrisome" because she has examined the noses of humans in Mexico City and found evidence of a breakdown of nasal tissue, similar to that found in dogs.[6]

U.S. EPA researchers and colleagues in Germany have found that metals attached to fine and ultrafine particles greatly exacerbate asthma. First they examined children in a German city where the air is contaminated with fine and ultrafine particles mixed with metals. Compared to children living in a rural German town where the air is relatively clean, the urban children showed strongly allergic reactions. The researchers then exposed mice to the two kinds of air that the children were breathing. They reported that mice exposed to metal-contaminated ultrafine particles developed strong allergic and asthmatic reactions in their airways.[18]

Using isolated lung cells, researchers found that ultrafine particles from Los Angeles air (a) carry far more toxic combustion byproducts per unit weight than do larger particles (no surprise because of surface-to-volume ratio); and (b) enter cells and settle in the mitochondria, which are the cells' source of power. Ultrafine particles turn the mitochondria into "functionless bags," researcher Andre Nel told Science News, killing the cells they were powering.[7, 6]

In sum the nanotech industry and the U.S. government are rapidly ramping up a new industrial capacity to manufacture ton quantities of ultrafine particles, very similar to particles already known to be killing tens of thousands of people in the

U.S. each year. The complete catalog of harm from these particles remains to be written, but we already know that they cause or aggravate asthma and cardiovascular disease, damage the small airways of animals, adults, and children, carry metals and cancer-causing combustion byproducts deep into the lungs and even into the brain where they promote the growth of amyloid plaques associated with Alzheimer's disease.

We also know that the current regulatory system has proven to be incapable of bringing particulate pollution under control because of relentless opposition from corporations. As a matter of law, corporations are required to put profits before public health, so we can never expect them to do any better than they are doing today, until we change the law.[19]

Clearly, in the case of nano particles, we have reasonable suspicion of harm, and we have some remaining scientific uncertainty. Therefore we have an ethical duty to take preventive (precautionary) action. If there ever was a proper time to invoke the precautionary principle, this is it.[20]
=====

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[3] "The Little BANG Theory," ETC Group Communique #78 (March/April 2003). Available on the web at http://www.etcgroup.org/documents/comBANG2003.pdf .

[4] Jayne Fried, "Japan Sees Nanotech as Key to Rebuilding Its Economy," Small Times Jan. 7, 2002, pgs. unknown. Available at http://rachel.org/library/getfile.cfm?ID=223 .

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http://www.rachel.org/library/getfile.cfm?ID=280 .

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[8] Janet Raloff, "High court gives EPA a victory," Science News Vol. 159, No. 10 (March 10, 2001), pg. 159.

[9] Kent E. Pinkerton and others, "Distribution of Particulate Matter and Tissue Remodeling in the Human Lung," Environmental Health Perspectives Vol. 108, No. 11 (November, 2000), pgs. 1063-1069. Available at http://www.rachel.org/library/getfile.cfm?ID=281 .

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[13] D.M. Brown and others, "Size-Dependent Proinflammatory Effects of Ultrafine Polystyrene Particles: A Role for Surface Area and Oxidative Stress in the Enhanced Activity of the Ultrafines," Toxicology and Applied Pharmacology Vol. 175 (2001), pgs. 191-199. Available at http://www.rachel.org/library/getfile.cfm?ID=291 .

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[15] Leo Bouthillier and others, "Acute Effects of Inhaled Urban Particles and Ozone; Lung Morphology, Macrophage Activity, and Plasma Endothelin-1," American Journal of Pathology Vol. 153, No. 6 (Dec. 1998), pgs. 1873-1884. Available at http://www.rachel.org/library/getfile.cfm?ID=289 .

[16] Gregory A. Wellenius and others, "Inhalation of Concentrated Ambient Air Particles Exacerbates Myocardial Ischemia in Conscious Dogs," Environmental Health Perspectives Vol. 111, No. 4 (April 2003), pgs. 402-408. Available at http://www.rachel.org/library/getfile.cfm?ID=284 .

[17] Lilian Calderon-Garciduenas and others, "Air Pollution and Brain Damage," Toxicologic Pathology Vol. 30, No. 3 (2002), pgs. 373-389. Available at http://www.rachel.org/library/getfile.cfm?ID=292 .

[18] Stephen H. Gavett and others, "Metal Composition of Ambient PM 2.5 Influences Severity of Allergic Airways Disease in Mice," Environmental Health Perspectives Vol. 111, No. 12 (September 2003), pgs. 1471-1477. Available at http://www.rachel.org/library/getfile.cfm?ID=285 .

[19] Robert Hinkley, "Twenty Eight Words to Redefine Corporate Duties," Multinational Monitor Vol. 23, Nos. 7 and 8 (July/August 2002); available at http://www.rachel.org/library/getfile.cfm?ID=237 . And be sure to see The Model Uniform Code for Corporate Citizenship, available at http://www.rachel.org/library/getfile.cfm?ID=236 .

[20] On the precautionary principle, see
http://www.rachel.org/library/getfile.cfm?ID=187 and
http://www.rachel.org/library/getfile.cfm?ID=188 and
http://www.rachel.org/library/getfile.cfm?ID=189 and
http://www.rachel.org/library/getfile.cfm?ID=227 .

Tom Atlee * The Co-Intelligence Institute * PO Box 493 * Eugene, OR 97440
http://www.co-intelligence.org * http://www.democracyinnovations.org

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11/24/03

Jeff Philliber, E.P. Coördinator
LBNL
1 Cyclotron Rd. MS 90K0198
Berkeley, CA. 94720


LBNL tritium stack

Dear Mr. Philliber,

LBNL's LRDP EIR must include a review of the environmental, and health & safety effects of the construction of the Molecular Foundry and the Nanotechnology experiments to be performed at LBNL. The 1997 SEIR Addendum reported the Bay Area Air Basin was in non-attainment of state standards for concentrations of particulate matter less than 10 microns in diameter (PM-10). With Nanotechnology we're talking about particulate pollution that is 1/100 that size and smaller (PM-0.1). I know of no filter that will prevent these microscopic particulates from escaping into the Air Basin. The EPA won a U.S. Supreme Court case allowing it to control pollution caused by particulate matter with diameters of 2.5 micrometers or less (PM 2.5). Nanoparticles are 1/25 that size and smaller. According to Kevin Smith, in Environmental Health Perspective 6/03, ultrafines, or nanoparticles, kill off the lungs' natural defenses, promote free radicals, cell death, inflammation and eventually cardiovascular disease. Please include with my letter the enclosed 13 pages from Tom Attee with info from Rachel's Environment & Health News. Thank you.

Gene Bernardi 9 Arden Rd. Berkeley, CA 94704

Subject:
LRDP
From:
"Namkung, Poki" <PNamkung@ci.berkeley.ca.us>
Date:
Wed, 26 Nov 2003 17:17:07 -0800
To:
"'JGPhilliber@lbl.gov'" <JGPhilliber@lbl.gov>

As a private citizen and as a physician, I would like to add my support for the City Council's recommendations that LBNL review and assess what is known about the potential environmental and health effects of the development and application of nanoscience utilizing independent expertise in an open, timely, and public manner. I think that this is a frontier science and am most concerned about the potential effects on air and water quality and the generation of potentially hazardous toxins or materials. I am sending you this comment as a private citizen and not in my role as the City's Health Officer. Thank you.

Poki Stewart Namkung, M.D., M.P.H.
Health Officer/Director of Public Health
Berkeley City Health Department
2344 6th Street
Berkeley CA 94710
Tel: 510-981-5339
FAX: 510-981-5345
mailto:pnamkung@ci.berkeley.ca.us
mailto:5105153676@my2way.com

Subject:
Proposed Scope of Analysis for LBNLs 2004 LRDP EI
From:
Jennifer Pearson <jennifermaryphd@hotmail.com>
Date:
Wed, 26 Nov 2003 16:57:23 -0800
To:
lrdp-eir@lbl.gov
CC:
JGPhilliber@lbl.gov

Jeff Philliber, Environmental Planning Group Coordinator
Lawrence Berkeley National Laboratory, One Cyclotron Road, MS 90K, Berkeley, CA 94720.

Dear Mr. Philliber,   RE: Proposed Scope of Analysis for LBNL's 2004 LRDP EIR

After reading the Proposed Scope of Analysis for LBNL's 2004 LRDP EIR stage of the plan making process which anticipates development for the next 20 years at the Lawrence Berkeley Lab, I have a number of questions and comments I think should be included in the 2004 SCOPE documentation to serve as a baseline for 20 years hence.

I. I was unable to find a solid reference to the 1987 Plan (plus add-ons) with respect to building on the strengths, filling gaps, and otherwise improving upon that Plan's weaknesses. This raises the question of what does the current planning community mean by "SCOPE" in 2003, and how has that changed from 1987? Did the Scoping in the 1987 LRDP included fewer characteristics to evaluate than LRDP Scoping does in 2003?

One could argue that in 2003 there is increasing environmental awareness as well as awareness of environmental illness such as radiation sickness and lead poisoning. One could argue that there is increasing awareness of infrastructure weaknesses such as seismically damaged sanitary sewer and storm drain utilities underground of the Lab that we know are leaking toxins into the groundwater and likely will end up in Strawberry Creek and its tribulets. One could argue we are more aware of the preservation of natural habitats in the wild lands the Lab rents from UC than before, which would likely be damaged by even more development of any sort.

II. Perhaps, it would be wiser "to clean house", fix up the infrastructure and reallocate existing facilities of unused space before sprawling into outlying areas of pristine land? Can you clarify the mixed signals we have received this month in the Scoping phase of the planning, with respect to current planning state-of-the-art-thinking on urban sprawl construction into outlying pristine environmental land, versus the alternative of infill planned construction in the heart of the built clusters at LBNL?

III. And in the face of the Bay Area region's projected growth, at this time of budget shortfalls, wouldn't it be smart to use a sustainable development model for planning facilities in careful detail with respect to costs and benefits by revitalizing existing buildings which already have stable soil sites and even have utility hookups?

IV. In the case that the Lab will no longer occupy the Berkeley sites, one could imagine those facilities prepared for potential educational use in the University's mission of education, research, and community service.

Isn't scoping as a set of applying currently adopted policy under law a set of principles that evolves over time? Therefore if the time line is until 2020 then current planning must evaluate the flow that goes back--as well as forward, rather than be stuck in a static land use notion that appears to be one of urban sprawl taking of more and more pristine land in outlying areas that could instead be protected to sustain our lives with our cleaner air, water and soils?

I would plan differently. Perhaps you have another two plans that have not been shared with the public?

I would imagine:

Plan A for Future Development as one imagines the Lab Stays forever

Plan B if the lab goes--then convert to educational facilities

Plan C if the lab stays for only the next contract period

As I understand it, the LBL is portrayed as the brainchild of the 3 Labs under the University of California contract with DOE. The Lab conducts threshold research where theoretical one-off design models are invented and then go to industry for the appropriate applied testing. Now, that the future of the location of the Lab is in question. At the May 15, 2003 Board of U C Regents Meeting former President Atkinnson and Ambassador Linton Brooks (the current Director of the National Nuclear Safety Administration), brought into the open that the DOE is requesting the University administration to competitively bid on the next contract. The discussion covered the possibility of the Lab leaving Berkeley and going to the University of Texas or elsewhere. Either the contract will be renewed or the contract will be cancelled. The continuation of the DOE Lawrence Berkeley National Laboratory under the present arrangement at the Berkeley/Oakland site on University land will be no more.

In national politics dominated by a Republican administration, Republican Senate and House majorities in Washington DC, there is less support for the dominantly Democratic Party San Francisco Bay Area economy and the University of California Systemwide. Contrast this with much support to contract with research centers and universities in Texas.
Such a shaky future bears enormous implications, not only for the University's budget, but also for the entire Bay Area economy.

V. Pivotal questions that are being discussed far and wide are not at all addressed in the LRDP 2004 initial study. In my experience working for a County Supervisor in the 1970's, these questions would normally fall within the scope of modern planning. To begin, a few are:

What projects would leave with the Lab contract?

What scientists and support staff would leave?

What offices and building would be vacated? What is the projected number of gross square feet (gsf)?

What percentage of the average daily population would no longer be driving to the Lab?

Would the bus service leave and no longer transport faculty and staff to the present stops?

Would the Lab take moral authority and complete the designated clean up of the toxic ‘stains’ from chemical and radioactive waste in the groundwater, soils, creeks, and vegetation before it closed down?

Or, would the University be left with the toxins problem that has been accumulating for 60 years?

To what degree would that cleanup extend: to a zero tolerance of a full clean up level as requested by the City of Berkeley?

Or, would the clean up be ignored, as is the tendency on many former military bases?

Or as knowledgeable community members fear, will we be mind-boggled with the public relations outbursts to control public outrage?

VI. A CONPREHENSIVE ALTERNATIVE ANALYSIS to revisit the two planned projects, Building 49 and the Molecular Foundry of 2003 that somehow escaped the current planning that you opened in 2000.

One could argue that the concept and plan for the Molecular Foundry is not unique, it is DUPLICATIVE of other MF’ under DOE in other parts of the country and therefore is an "extra"one. Those other sites have buffer zone perimeter, which safeguard the laboratories while this proposed building site in the Strawberry Canyon Watershed does not. To my knowledge those other foundries do not have to consider firestorms, earthquakes, and landslides and are not located in an area at high risk for terrorism under the Homeland Security designation. A full EIR with public imput would have given you details on these issues to answer to. Please revisit these considerations; these projects belong to the land base and therefore are within the scope.

VII. What follows is taken from a letter that I sent to Senators Boxer and Feinstein in October 2003 expressing my opposition to the Nanotechnology Molecular Foundry appropriation for LBL’s Berkeley Campus after the project was certified by the Regents.

"On the Energy and Water Bill conferencing, please consider eliminating the funding for MOLECULAR FOUNDRY for the Lawrence Berkeley National Laboratory and setting a MORATORIUM on the project until we have a thorough discussion about the health and environmental implications of molecular nanotechnology. We should also have a firm and grounded understanding of any associated hazards, likelihood of accidents, and whether it should be sited in a secure area away from densely populated areas…

Nowhere is this facility PROPOSED AS EDUCATIONAL for a university community…

The scientific community knows very little about the health and environmental impacts of molecular nanotechnology.

On July 8, 2003, the US EPA, through its National Center of Environmental Research, released a Request for Applications entitled "Impacts of Manufactured Nanomaterials on Human Health and the Environment" in which it states "There is a serious lack of information about the human health and environmental implications of manufactured nanomaterials, e.g., nanoparticles, nanotubes, nanowires, fullerene derivatives, and other nanoscale materials.
Table 1 provides an outline of nanostructures, their size, and material into which they may be formed, indicating the type of application in which they may be used. Environmental and other safety concerns about nanotechnology have been raised (Dagani, 2003; Masciangoli and Zhang, 2003; Service, 2003). As part of EPA's mission
to protect human health and the environment, this solicitation requests research proposals which address potential health and environmental concerns of nanomaterials." See, http://es.epa.gov/ncer/rfa/current/2003_nano.html for the full document.

Given our lack of knowledge about the potential health and environmental effects of this new and untested technology, should we not ensure that it would do no harm? Should we not wait until we, the public, are satisfied that scientific due diligence has been conducted and no harm to life and the environment is shown before this technology is released upon the world?

Here are other reasons that funding and building the Berkeley facility is inappropriate:

The proposed Foundry is duplicative—the National Nanotechnology Initiative lists several other Foundries with the very much the same research plans.

All of those foundries are at SECURE sites; LBNL has no buffer security perimeter to protect nearby classrooms and homes

It is advertised as a user facility where "…what could you make if you could build things atom-by atom?"

and"…to develop and study both "soft" (biological and polymer) and "hard" (inorganic and fabricated) nanostructures and how they can be assembled."*

Any facility that creates experimental human, animal, and plant life forms (biological life) then destroys that life in thousands of trials, raises again the issue of when does life originate and who has the right to destroy each life? This is troubling for theological thinkers. Just imagine the implication of this?

Thank you for your kind attention,

Very truly yours, Jennifer Mary Pearson, Ph.D., Berkeley, Ca 94709

* From: "Berkeley Lab A Place of Wonder"

Subject:
Scope of DEIR should include serious examination of other technology-rich, depressed Bay Area communities such as Pleasanton, Hayward, Fremont, Oakland, and Richmond as possible nano-tech sites.
From:
David Tam <tamnacexcom2@yahoo.com>
Date:
Wed, 26 Nov 2003 16:38:52 -0800 (PST)
To:
lrdp-eir@lbl.gov
CC:
andykatz@uclink.berkeley.edu, chpederson@yahoo.com, elbmarin@aol.com, hankr@earthlink.net, helenburke@earthlink.net, hmclean@uclink.berkeley.edu, jlamont@creekcats.com, joanne@sfbaysc.org, jonna@sfbaysc.org, joyceroy@earthlink.net, kirk.abbott@angelfire.com, lvurek@igc.org, mdaley@sfbaysc.org, mike.daley@sierraclub.org, mmacris@aol.com, n.laforce@comcast.net, piperrr@alum.mit.edu, pwebsky@earthlink.net, richs59354@aol.com, spbloom@earthlink.net, tamnacexcom2@yahoo.com, wjasmith@aol.com, yodeler@sierraclub.org

TO: Jeff Philliber
FROM: David Tam (tamnacexcom2@yahoo.com; PO Box 601, Berkeley CA 94701-0601; 1-510-472-5723)

The Scope of the DEIR on the LBNL LRDP should include serious serious examination of other technology-rich, depressed Bay Area communities such as Pleasanton, Fremont, Oakland, and Richmond as possible sites for the new nano-technology facility. All are BART-accessible.

Subject:
Comments on proposed LRDP-EIR
From:
Robert Clear <RDClear@lbl.gov>
Date:
Tue, 25 Nov 2003 15:28:26 -0800
To:
lrdp-eir@lbl.gov

To Jeff Philliber
LRDP-EIR@lbl.gov
Comments on Draft EIR for LBNL Long Range Development Plan
November 25, 2003

1) Transportation:
The LRDP EIR says that it will analyze the impact of increased traffic (checklist, page 18). Although the plan says that it will "promote alternate forms of transportation" (page 10), it also says that it will provide parking to support an increased population. On page 5 of the report it states that the "current objective" for LBNL's parking is 1.7 employees per parking space (0.59 spaces/employee). Based on the figures provided on page 5 the current ratio is 0.53 spaces/employee (2200 spaces for a daily population of 4300), thus the current objective is to increase not just the absolute amount of vehicular traffic, but the relative amount as well. This is not consistent with the goal to promote alternate forms of transportation.

The current level of vehicular traffic already contributes to significant congestion. Increased traffic will not only add to congestion, but will also make alternate modes such as walking and bicycling less safe, and less attractive. The EIR will need estimates of the current mode split, plus estimates of future mode splits. Any estimates of future bicycle or pedestrian access must account for the detrimental effects of increased vehicular traffic.

The lab currently encourages alternate transportation through a lab shuttle. The EIR will need estimates of the degree of mode shifting that can be expected from increased incentives. The EIR should examine monetary incentives such as subsidized transit, or direct pay-out, time incentives such as increased frequency of shuttle service, satellite parking with shuttle access, more shuttle routes and extended service in mornings or evenings, and increased ease of access via better bicycle lanes, more point of use bicycle parking, and possibly an exterior escalator or moving walkway for improved pedestrian access.

Bicycle and pedestrian access via Strawberry gate is influenced by the condition of Centennial road. Currently, pedestrian access is unsafe due to slip hazards adjacent to the fence of the Botanical garden. Night time bicycle egress is unsafe because of insufficient street lighting and a road geometry that aims vehicular lights directly into opposing traffic. The EIR needs to address the possibility of cooperative agreements with other entities in the upgrading and maintenance of access routes to the lab.

2) Space use efficiency

Page 10 states that a draft policy of the LRDP is to “replace old low density with new space efficient facilities”. Pages 7 and 8 show that current space use is 409 square feet per employee, and that the planned expansion is 667 square feet per employee. The issue of what constitutes space efficiency in a modern setting needs to be explored more fully.

Most of the current lab buildings appear to be from 1 to 4 floors high. The planned molecular factory is 6 stories. The EIR needs to distinguish between gross square feet and the added footprint of planned construction. Impermeable surface area should be listed as building, parking lot, and road or other surface. The impact of new buildings needs to include any added lots or access roads.

Currently, there appear to be no parking structures on the hill. Planned expansions which only include parking lots will have a much larger impact on the built footprint in the lab area than would equivalent construction with parking structures. In addition, existing parking lots could be converted to parking structures to either provide parking for new construction, or to allow conversion of other lots back to open land as a mitigation measure.

3) Page 10 states that a draft policy of the LRDP is to “Promote infill development sites reinforcing the cluster concept”, and also states that a goal is “Site development adjacent to existing development and utilities”. The latter goal is sufficiently vague that it could apply to essentially any site along the current road system, as well as a number of sites off of it. The two current construction plans, the molecular foundry and building 49 are both examples of development adjacent to existing development. Currently the Bevatron and old-town areas of the hill have undergone some degree of decommissioning and dismantling, and are not being intensively used. In terms of the first goal, these appear to be prime areas for planned expansions. However, these are also sites which have been contaminated by past activities. If they are not cleaned up in a timely fashion, they will not be available for future expansion. The draft EIR needs to address the questions of funds, the degree of clean up required to reclaim these sites for potential use, and the timing issues involved. If these sites cannot be reclaimed during the LRDP period then there is much more limited possibility for infill development, and there should be a serious question as to whether further growth on the hill is acceptable during this period.

4) The proposed plan is to add up to 1200 new staff. This presupposes growth in research needs in the national laboratories plus some allocation of that growth to LBNL. The EIR should address the planned or estimated overall expansion of research in the national laboratories, and the degree of coordination between the labs in handling this growth. Some of the labs have may more room for growth than some of the others, and there may also be a potential for the development of new national laboratories. It should not be presumed that growth is either desirable or necessary for this site.

A major advantage of the LBNL site is its proximity to UC Berkeley. Currently LBNL has about 5% of its space off-site on the UC campus, and has another 15% in lease space. The proposed LRDP appears to assume no or even negative growth in these off-hill sites. In addition, the proposed plan emphasizes research clusters, which would presumably be incompatible with off-site space. The plan does not address the counterbalancing potential benefits of off-site space: better access to and increased collaboration with UC Berkeley, and a wider access to buildable sites, with better transit access and less environmental impact. These issues need to be evaluated in the EIR.

Robert Clear
rdclear@lbl.gov

Subject:
Comments of Long Range Plan
From:
Howard Matis <matis@comcast.net>
Date:
Wed, 19 Nov 2003 20:59:38 -0800
To:
TPowell@lbl.gov

Terry,

I could not attend the Long Range Planning Meeting. Please forward these comments to the Long Range Process.

I understand that many residents want Lab Employees to take public transportation. It certainly laudable and better for the environment if everyone takes public transportation. However, the facts of life in our area is that for many people public transportation is not practical and the LBNL long range plan must take into account that many employees must drive to work. There is no evidence that public transportation will get better. Planning must reflect that fact. Restricting car access to the laboratory will not reduce the number of cars. It will just make the current situation worse.

Here is a recent example of the problem with public transportation. I built my house in a place that had public transportation. Recently, AC Transit proposed to remove our bus service and to others who live in hill areas. As Berkeley residents in general did not support restoring the service to the Hills, many hills residents have lost public transportation. There is no suitable public transportation in my neighborhood.

Many laboratory employees have no access to public transportation. They must drive their cars or not go to work. The current political climate does not support public transportation in all areas, therefore the LBNL plan must include the fact as there will be a segment of employees who must drive to work.

It is clear driving to work causes congestion in Berkeley. The longer cars are tied up in traffic, the more pollution. Therefore, the laboratory should explore ways to improve the traffic flow. (Discouraging traffic is ineffective and leads to more congestion).

The following ways should be explored to speed up traffic:

1) Stop signs should be replaced by traffic lights wherever possible - especially upon approaches to the laboratory.
2) On streets with congestion near the University, there should be no parking during commute hours.
3) The intersection near I-House is a major problem and should improved. For instance, the "no standing" sign near I-House should be enforced. The University should ban commercial deliveries during commute hours.
4) Gayley Road is a transportation nightmare. The possibility of lowering the road and adding pedestrian overpasses should be explored.

The lack of employee parking causes extra travel time as employees take a long time to find an available spot.

1) Extra parking places need to be created to eliminate this extra driving time. With less driving time there will be less air pollution.
2)The laboratory should explore ways of concentrating parking areas near employees work locations. Making a more efficient allocation of parking rather than increasing the number.

Howard Matis
LBNL Employee

Therese Powell <TPowell@lbl.gov>
Community Relations Officer
Lawrence Berkeley National Laboratory
One Cyclotron Rd, MS 65A0101, Berkeley, CA 94720 tel: 510-486-4387

Add to Personal Address Book

Subject:
late night thoughts after the public scoping meeting
From:
JThomas621@aol.com
Date:
Tue, 18 Nov 2003 01:31:13 -0500 (EST)
To:
lrdp-eir@lbl.gov

Dear Jeff,

I would like to add this comment to my comments made earlier tonight. Please include in the EIR an estimate of the % of the LBNL Hill Area land that will be built out at the completion of the LRDP in 2025. In other words, what percentage of the total land mass will be buildings and what percentage of the total
land mass will be parking lots , etc.

The visual rendering in one of the posters tonight was misleading because the LBNL borders were not well-marked. By including UCB land, the relative building density looks more spacious than it probably is. By reporting the percentages, it should clear up any confusion that the interested public might have.

Thanks.

Janice Thomas

From:
carole schemmerling <caroleschem@hotmail.com>
Date:
Thu, 06 Nov 2003 17:49:22 -0800
To:
JGPhilliber@lbl.gov, caroleschem@hotmail.com

Jeff Philliber
Environmenal Planning Coordinator
Lawrence Berkeley National Laboratory
One Cyclotron Road
Berkeley, CA 94720

Dear Mr. Philliber;
The Urban Creeks Council of California is very concerned about the proposed development, both short term and long term at LBNL. The impacts of the proposed projects to the ground water, the streams, vegetation and both human and animal health and safety are potentially quite dangerous. Therefore we make the following five recommendations:

*That a moratorium be placed on any new construction at LBNL until it is decided whether the DOE projects will be moved to Texas, and

*That the DOE be required to clean and detoxify all the existing buildings and land that they have vacated and promised to remediate and have not, and

*That there be no new buildings or facilities constructed on any land that is now open space, and

*That whoever manages this site develops a master plan for the cleanup, ecological restoration and maintenance of the headwater streams of the USA.

*That if the funding for the Nanotechnology Molecular Foundry does make it through Conference that a full, independent Environmental Report be carried out with public input and public review for the foundry and all other new development.

Carole Schemmerling
V. Chair, Board of Directors

Transcript of November 17, 2003, Scoping Meeting

LBNL 2004 LONG RANGE DEVELOPMENT
AND
ENVIRONMENTAL IMPACT REPORT

November 17, 2003
North Berkeley Senior Center
1901 Hearst Avenue
Berkeley

REPORTER'S TRANSCRIPT OF PROCEEDINGS
BY: STACY L.D. RODRIGUEZ, SHORTHAND REPORTER

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PROCEEDINGS

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(ON THE RECORD, 7:10 PM)

MS. POWELL: If everyone would like to take their seats, we're ready to begin.

Actually, for most of this you can still look at the posters if you're interested, but I would like to welcome you tonight. My name is Terry Powell. I'm the Community Relations Officer.

Just some general information about the building and the meeting tonight. As you know, the bathrooms are out the door and to the right, both men and women's.

Our meeting is scheduled for two hours, because we didn't start right on time. We have salmon-colored comment cards for you. They're available with sign-in sheets and the handouts in the back of the room. We have a court reporter present now, and she will prepare a transcript of this meeting which will be then posted on the Lab's website when it becomes available. Other records of this or other meetings are not in the official Laboratory record. This meeting provides you with the opportunity to make comments on the long range development plan's EIR. Please give your full name for the record. You'll be given three minutes, so try to keep your comments or questions to that time. You may step forward to the microphone at the podium to make your comment. You may also write your comments on the salmon-colored cards, and give them to Beverly Harris or Ms. Stuart in the back or Angel Williams in the back of the room.

If there is time available after everyone has had a chance to speak, and you would like to make additional comments or questions, please do so. Responses to your comments will not be given tonight with some minor exceptions that Jeff will outline. Responses will be prepared in written form and placed in the record of the Environmental Impact Report. Please feel free to write your comments and hand them in tonight, or send them directly to the Laboratory.

A portable audio system is being used, so let us know if you cannot hear something. If you would like to receive future notices, please fill in the requested information in the sign-in sheet. The environmental documents for this project are and will be available on the Lab's website at www.LBL.gov/LRDP. They're also available in the Berkeley Public Library, second central -- second floor reference desk area.

For those of you who don't have the agenda, tonight we're briefly going to go through an overview and outline of the long range plan. Then, of course, most importantly, your comments.

Now I'd like to introduce Ally Benson, our Laboratory Deputy Director, who will give you a brief

overview.

MS. BENSON: Good evening. I'd like to welcome you all to the scoping meeting or the EIR, for the long range development plan. We're looking forward to your input, and appreciate that you took the time to come and give us your input this evening. So long range planning is critical to Berkeley Lab's ability to meet its mission. We need to provide a site that is satisfactory in terms of meeting all of those needs, and what I'd like to do -- probably -- I'd like to just briefly go over what our mission is because that really provides the context.

So the first of our missions are really to address the fundamental questions about the nature of the universe, what it's made up of, where did it begin, how did it begin, and how is it going to evolve over time.

The second major area of investigation is into an area of trying to develop solutions to some of the most pressing energy and environmental concerns facing the globe. Things like global climate change, things like environmental contamination.

We also have a mission to develop new materials that will improve the quality of life for everyone in the environment, and also for human health.

Finally, we have a mission -- a broad mission to ensure that the United States remains competitive with regard to scientific research in a whole spectrum of areas that underpins the economic health of this country.

So, this is our broad mandate. So the question is then, is what kind of attributes do we need to have at our site so that we can fulfill this mission?

The first of these is to create an environment to enable disciplinary research. What we mean by that is the research not where one individual works by themselves, but where teams of scientists covering a broad range of skill can come together to be -- so we need to create common places where people can come together to enjoy the time thinking about these challenging issues together.

We also need to create an environment and a place that can house national user facilities all over the world to one-of-a-kind unique kind of abilities where they can do their own individual research, but at facilities that are developed by the Department of Energy. Examples of these: National Energy Research Supercomputer Center, one of the largest non-classified computer centers in the world, things like the Joint Genome Institute -- all different kinds of forms of life and places like the Molecular Foundry, where people begin to design new kinds of materials and add them at the time with very special properties. So we also need to find a place -- create a place that's appealing to students and faculty, to create a good learning environment, that is an attractive

place and desirable place, where people come to be part of our environment and our staff. It's also very important for all of us to be good stewards of the environment, both the national environment that we live in, as well as good citizens and neighbors to our community. And finally, we want a place that welcomes and encourages knowledge and exchanges the technology transfer with industry and universities alike. So these are some of the attributes as we begin to think about the LRDP, that we want to create an environment that would achieve these goals.

So, I'd like to say a little about -- about how we go about carrying about our missions. I've talked a little bit about what it is, but I'll get a feel for the kind of science that we do.

I'll start with energy in the environment. Many of you may know that the environmental energy technologies division in the Laboratory is really leading the world in terms of new energy-efficient technologies. Examples include lighting, window coatings they have developed, appliance standards for many of the appliances. When you go to the store and buy a refrigerator, those energy requirements have been developed by scientists at our laboratory. So it's really made a huge impact, and billions of dollars of savings in energy alone. So this is a very important area.

We are also very interested in solving the climate change problem. There's a poster over there. There's some testimony that I provided looking at technologies that can mitigate CO2 emissions to the atmosphere and basically avoid ground water clean up, soil clean up, and so forth. So, that's one big area.

We also work in the area of bioscience and health. We have a large number of researchers trying to understand and develop techniques for preventing cancer, and they start with the very basic building blocks of life looking at genetic material, looking at proteins all the way through cells, and there's got the beginnings of an integrated program that allows us to unite at all these levels.

We're also working in the area of nanoscience. This is a comparatively new area. Material sciences in particular, are working to develop tailored materials that have just the perfect set of properties to deliver a particular function and Paul Acedo, the leader of that program, has also made some real advances -- solar cells as an example. They're also trying to develop much stronger materials. In particular, bones and so forth, is what can we learn from nature about these incredible materials that ever withstood the test of time.

There are also important issues that how could we store hydrogen. That would be a big bridge towards creating the hydrogen economy of the future. So, nanoscience nanotypes

are being studied to do this kind of thing.

At the heart of our science is really probing the fundamental nature of matter and energy. There have been very exciting discoveries in the past several years. The fact that the universe is mostly made up of dark energy, dark matter -- things that we can't see, but they know they exist. Because the earth is accelerating, and the universe is accelerating at an even greater pace. So, we have people who are working that will put a satellite up at Supernova, and understands use and understands this is the very beginning of the universe, and how it will evolve.

And finally, computing is a big part of the fabric of our laboratory. Simulation of very, very complex problems is cutting edge. Science has many, many areas, and the examples we're working on stimulation of global climate change. Combustion of fossil fuels and simulations for example, of groundwater contamination. So, these are the kind of science that we do now, and that we envision as being a very important part of your long-range development.

So, now coming back to the to the long-range development plan and the Environmental Impact Report, these really go hand-in-hand. The long-range development plan describes the physical attributes that would be needed to accomplish our mission and the Environmental Impact Report is a companion document that provides an opportunity for input to dialogue with your neighboring communities. It helps address how the Lab's development will act in accordance in our neighborhood community, and finally, it helps us bring environmental consideration into focus as we examine how to develop the site.

So with that, I'd like to move on to the main part of the program, today, but first, let me thank you again for your attendance tonight. I really appreciate it, and we look forward to hearing from you. Thank you.

So, I'd now like to introduce Rich McClure from our planning department, who will talk more about the long-range development plan.

MR. MC CLURE: I'm going to speak for a few minutes here about the long-range development plan. It will be a turn from 2004 to 2025. And there's the acronym, LRDP, and you see that around the room that what it means, long-range development plan. Our approach to the LRDP is to relate the science which is otherwise not related to the physical setting and to establish a framework for the physical development of the Laboratory through 2025, and our LRDP is being prepared concurrently with an EIR. The scope of the LRDP covers a few items that are not typically covered in the general plan or other thing. Let me run through what those are. We have a community and environmental setting. Land use development framework the design framework population and

space those are projection as you see in a moment. I'll go through each of these very quickly here. The community and environmental setting is a very important one to us. We've been working with members of the community for quite awhile, and we have a particular note here to the management program, the wildland fire risk reduce, and there are other factors here who does our stream programs and other things up here as well.

In land use, we're looking at three different land use designations on the site. One of them is the developed area, and that's areas where there are buildings, roads, parking lots, corridors and such.

The second one is vegetation and fire risk management areas, and there are a number of those around the site. Those have an additional attribute of being areas that they're not developing in, or it would be completely in some cases grasslands, but in addition to the trees and the other investigations on the main site, it's in the developed area -- there's this ring almost around the Lab there. And then we have areas that we will very much limit for management and in many ways entry, and these are areas, for instance, some -- there's one that has been identified as a potential habitat -- viable habitat for the Alameda whip snake on site. These are areas we're not really moving into. Another one is on the side of the north, Strawberry Creek along Chicken Creek, where we'll have areas we'll do minimal work, clean up the vegetation that is underscored on the exact perimeter of those roads, so that they will survive a wild land fire, but do relatively little in the area. The development framework -- and this one's really faded out, and I apologize. We're looking at a series of research clusters. Those of you which are familiar with the Laboratory know that we developed on the more or less as needed basis, so when an experiment came along they added a building or did something, and this is to get a sense of unity and cohesiveness across the main site.

At this time we're not in the position to demolish or to do major -- accomplish something that has a little more coherence. So, what we're looking at is how can we develop meaningful assemblies of buildings, and these are very much other natural settings that are -- each of these would have more or less a keystone building or a plaza or space that then draws people together in those areas and has a good relationship. So, we're moving towards another era of design up there that I think you will find much more favorable when you do see things. But again, we're going to be keeping that setting of the buildings innate is very much the dominant theme here, so you're not going to see whole buildings except in a few cases. One most recently coming forward, trees need to be planted in front of it -- is that's going to be happening. Then we 1ave a design framework, and I was talking

this is just kind of the -- in the advanced light source old town area as it goes into a common area, the cafeteria area, and such.

So, we' 5 looking at how do -- we create pathways that basically reflect there, so people can have interactions. How do we get people on single pathways characteristically, and have interactions that are very important for the science, and basically improve the overall character and the health of the groves in here? We planted many trees back in the early 60's, and they're planted much too closely together. We really need to be thinning those out. But the whole intent there is to get the healthier groves in here as well. Then we have a population and space. The population we currently have is approximately 4,300 average daily population, and that's calculated by taking 100 percent of the full-time employees up there at the Laboratories' team at the Lab, and 40 percent of the total number of guests that we have registered. You know, we have user facilities that draw users from across the world actually, and so, in our surveys, we found that typically you had at peak times -- 40 percent of them on site. So we put them on here as the figure to calculate that, and we project 5,500 again out at this, the 25-20 range.

amount of space, and we're keeping that constant as far as the communities of space, and the LRDP process as well as we're looking at having the draft LRDP out in February '04. The public comment period ends April '04. We're looking at the final long range development plan in late June-July of this next year available to the August timeframe within regents meeting to review it and improve it in August '04. And I think that takes us to your next part here.

MR. PHILLIBER: Hi, I'm Jeff Philliber. I'm the Environmental Planning Coordinator at the Lab, and I'm going to speak about -- I'm going to speak about the upcoming Environmental Impact Report that will be prepared for the project. I'm going to wait for my slide -- great.

The Environmental Impact Report that we will be preparing for this project, which is the LRDP, will be a programmatic one which replaces the 1987 Long Range Development Plan Environmental Impact Report as amended.

Many of you have followed your -- are familiar with that series of documents. It includes the '87 EIR, Supplemental EIR, and the addendum to that -- that was done in '97. The -- the programmatic document is intended to cover the entire breadth of our site geographically as well as the duration of the project, which, as you know, goes through 2025. The way that the programmatic document works, and in particular in this case, is as a future project comes about,

we'll first take a look at the project and see if it's in conformance consistent with the something that's envisioned in the framework of our long range plan EIR. If that's the case, then we move on and decide whether the impacts that would arise from the project have been covered in this document. If they're not, then we need to prepare a tiered document. A tiered document is usually an Environmental Impact Report or a Negative Declaration of a categorical exception under CEQA that incorporates any reference to the programmatic document. We would decide what level of programmatic document to prepare, and we would decide what issues need to be focused on, and also, focused out from that tiered document -- tiered document. These are the areas that we will look at the impacts of -- to these areas in our upcoming Environmental Impact Report.

We've focused on two areas here: Mineral resources, and agricultural resources, which don't really pertain to the Lab. We'll probably not concentrate on requisite resources too closely, and we will do a very comprehensive cumulative impact assessment in this document.

This -- this table didn't translate too well, but it shows the opportunities for public involvement in this process for the NOP. Of course, you can give us your written comments, as well as review the document itself.

The public scoping meeting, which is tonight, gives you a chance to give us written comments on comment cards, as well as to give us your spoken comments.

When the draft EIR comes out, you will be able to review that document and provide us with your written comments. We'll have a public hearing on the draft EIR, at which time in a forum very much like this one, you be able to give us your spoken as well as your written comments at the meeting. When the final EIR is issued, you'll be able to review the document to provide your written and spoken comments to the regents.

Our schedule is as follows: We're in the NOP period. The scoping meeting is tonight. The draft EIR is expected out in February of '04. We'll hold the public hearing probably in March. The final EIR is expected to come out probably in the July-August timeframe, and we'd like to go to the regents in August.

And that ends my slides. So, I'm going to turn it back to Terry. I will begin to take your comments.

MS. POWELL: Now starts our comment period, and we'd ask that you come up and speak at the podium. And L.A. Wood was here first -- and I know you have another meeting you have to go to, so if you'd like to start off, please do.

MR. WOOD: My name is L.A. Wood, Berkeley resident. Live within a mile of the Donner Lab part of LBNL. The commission, a few nights ago, made some recommendations

that we've submitted. I'm not going to belabor those, I just want to say something about the process tonight.

I think that the community is very grateful that LBNL would do a long range development. It's always so wonderful when one of the largest businesses in town comes forward and wants to talk to the community.

My problem is that often times, like tonight, we are offered up LBNL with the wonderful world of science with all the posters, and when most of us recognize that that's not the issue tonight. It shouldn't be the issue tonight. Tonight the issue should be the development of the hill, and some of the activities that are going to go on up there. I think that the hill represents a -- a huge resource that I think that the lab is -- 'cause you think you call it the "neighborhood communities" as you referred to us -- is that we're not really being considered. It's that equation I don't believe with the development.

Right now, apparently, you have 25 percent of the hill that's already -- that's a serious problem when you propose projects of the area -- the deficit that you are talking about that administers development modes more imperious surface when -- you know -- in business, it's better to consolidate yourself.

I also want to say something about the watershed. The watershed up there is very, very important to Berkeley. We on the commission have tried to get the city to clean up the watershed and be sensitive to it, and recognize that the development destroys watershed. There's no way that you can put the kind of development that you want, a million square feet on the hill and not absolutely destroy that -- the environmental -- the environment of the hill, and the resources of the community. We're not talking about this is a resource that has been in Berkeley that Berkleans have been able to use for some time, and I think that what you're creating long term is something that's not very desirable for the community at all.

As I said, I just don't think you may be studying some of the science of the hill. But even though some of us have problems, you should know that we know now that -- things -- we do weapons work, and you know, we're very concerned about that. Weapons-related type work. We know in the future that's going to be more the case then it is told, and those are very serious concerns to us.

And I just want to say that -- that one last comment that with regard to the Lab. I think that maybe the one thing the Lab doesn't realize is that we're not against its science, we just think it didn't respect the fact that it is in a local area urban area, and many of the science that they want to pursue are important to pursue, but are detrimental to the air quality, and to the environment of Berkeley.

And I need to be done. Someone else like to come up and speak?

MR. SHARP: I'm Jim Sharp. I've been a 35-year resident of Berkeley, and I'm ready to buy one of these photos, because I think it's one of the best things the Lab has produced that I've seen.

Let me just point out that the first time I saw the Long Range Development Plan come by -- was it three years ago? October 2000 -- and I haven't heard tonight why there is a three-year hiatus. Nevertheless, I spent a lot of time at the University, studying what was called city planning in those days -- city regional planning. And one of the things we were taught was that planning is really thought before action. But what we've seen recently in the last less than twelve months is sort of action before thought.

I think it was on December 10th last year that I first learned about the Molecular Foundry. A Notice of Preparation came out, and everything proceeded very rapidly after that. And the regents finally approved the foundry. I think it was early March -- I don't remember exactly. And along came Building 49 which is one of total out source. Building 49 -- which is kind of amazing if you can outsource a building on campus you can imagine the implication of every building was owned and operated by an outside contractor. The -- when that first came out, we were going -- the Lab was going to cover a riparian corridor with a parking lot. Well, they backed off on that around July. But I -- you know in just the last less than a year, I've been surprised at -- at the way the people that are running the Lab are -- are -- you know -- rolling these projects again without planning. It seems to be the actions preceding the thought.

Okay. I do know -- and again, some of the people here aren't very actively involved in this, and I appreciate the efforts to get the word out. But I see some of the -- what masquerades as thought or whatever is -- is really public relations. And the one that got my attention just in the last -- in the last week, was something again for the Molecular Foundry. It's called "Nano-High." This is for high school students. Now okay, that's great. Let's let high school students learn about nanotechnology, and so on. But it's starting this Saturday, and you can take a class -- if you're a high school student, I mean. It's a one-day, or part of the day November 22nd. So, anyway, I'm saying let's get things turned around. Let's focus on the watershed. That's what we got here, and I'd like to see the Lab join forces with the University and the UC, and focus on the whole watershed and stop artificial planning as it were. Thank you.

MR. KELLY: Hi, my name is Michael Kelly, and I live on Panoramic Hill. First, I'd like to just say a little bit about what I hope the long range planning process might mean

to LBNL. Having spent a little bit of time on the work group, I know that there's two different ways that you can -- two different main attacks that deal with ceasing exposure intake. One, is that you can start with a young product you want to do a project you want to have your figures meet certain regulatory standards so you can work backwards is try the work around the problems that come up. Another way to look at ceasing health impacts and to actually look at health impacts. And the way we're really looking for problems. I will hope that at least intelligently within LBNL, this process can be a contemplative process in which you're actually looking for problems, and not just looking or avoiding bottom lines that are going to give you problems in your plan.

Having said that, I'd like to speak just for the moment on a different issue which is, traffic. The traffic corridor is south of Berkeley -- south side of Berkeley, Clairmont, Piedmont are constantly saturated during peak hours. I know there's a large session in the LRDP that can look at traffic issues. What I see not just from LBL, but from LBL, the City of Berkeley, and also the University is three institutions that try to take traffic seriously, but in the end, we've got an ever increasing problem, and to a certain extent, I think all those institutions have their heads in the sand about that. Because probably no matter how much you try to put in little programs that make things better in the end, this expansion is going to create extra parking spaces for extra cars along those corridors, and we're at the point now where people in the Lab have to drive through that. Think about what would happen when those corridors are fully saturated -- say 5:15 to the point where you can't even get off to the side because people are sort of stuck in all the spots in intersections where you should be able to turn, but you can't because people are just filling up all the space. What if a major fire starts on Panoramic Hill at that point? What does that do to emergency response? And this isn't just about emergency response.

Traffic is also a quality of life issue for all the people on those roads, and for the people that live around them. But I think particularly concern needs to also be placed on the saturation of those traffic corridors because they sit right on top of the Hayward Fault. They sit right adjacent to high fire danger areas, and it's increased risk. I mean, we saw the major earthquake that happened here and down in Santa Cruz happen at rush hour. Two major events that happened at the same time. Thank you.

MR. METSPHER: Good evening, my name is Ian Metspher. I'm here basically, to talk about transportation and traffic issues. Some of you know that I'm on the Transportation Commission in Berkeley, as well as an active member of Encina, which is the neighborhood on the south side

of Berkeley. But I'd like to speak about what you plan to do with the transportation element of this thing, because there are ways that we can help ourselves.

One of the first ones I'd like to see you do is consider an Ecopass for all of our employees. That should be done so you can encourage people to get out of their cars and make it worthwhile to get out of their cars. If you're going to add another 1,200 people to the Lab, we've got to get them on buses or public transportation of some kind or another.

The other thing is the corridor. The corridor at that time rated during rush hour, both morning and afternoon -- the only way I want the Lab to get very much involved in working with the city is to get carpooling lanes, or dedicated lanes, or buses during rush hour on our major buses to encourage people to ride on them. It's the only way you're going to get people to ride the bus. Get them on schedule and you can help.

So, what I want to see in the EIR is the budget items that produces money. To AC Transit to begin to help solve some of their problems which will make you better neighbors with us. Thank you.

MR. KELLY: Good evening. My name is Tom Kelly. I'm a resident of Berkeley, and also a member of the city's community health commission.

I'm just kind of curious -- you know -- if anyone here could -- would just raise their hands if they know what nanotechnology is? Everybody knows. That's great, because I have no idea what it is, and I've been reading about it for quite awhile. But the reason I bring it up is the City of Berkeley recently passed a resolution that requires the city to consider the implementation of the precautionary principle in all of its activity. It's going to go big. Sort of a review. And the idea is to try to minimize the harm that its activity is to its workers, and its citizens. And they're doing that even though they don't have complete scientific proof of the chemical or something that they're using is harmful to human health. And -- you know -- one of the reasons I think people that are starting to look at our environment like that is because we realize -- and I can say this because I also work in the Health Department where we look at the environmental causes of non-infectious diseases like asthma and autism, and cancers -- that there is so much in your environment that's having an impact on the health and we can't nail down the specific element that is causing that.

Cancer is increasing. Take respiratory disease, but we know that there's something going on, so rather than try to prove it, the precautionary principle would encourage us to step back, let the prominent something show that it doesn't have a harmful effect on the environment, and then introduce it, or offer it you.

The city of San Francisco has adopted the principle in all of its purchasing activity, because it's coming to the conclusion that it's a smarter way to go than the way they have been doing it in the past.

The union recently adopted the policy, which requires the manufacturer of the chemical to show that it's not harmful to human health before it can be introduced into the environment. It's revolutionary, because they've realized that they don't have any more proof than we do that something is harmful. They produce two or three new chemicals a year. They have no idea what it does. They don't know how it works. But we do know different types of cancers are increasing that are all fairly certain. So, just to show you that this isn't just San Francisco or Berkeley that's concerned, the U.S. Environmental Protection Agency understands a not very environmentally friendly president has issued a request for proposals that ask to look at the health effects of human health. And they say there's a serious lack of information about human health and environmental implications manufactured nanomaterials, nanoparticles, nanotubes to nanoscale materials. Potential harmful effects of nanotechnology might become aware as the appointment of the nature of the nanoparticles themselves is characteristic of the products made from them. The aspect of the manufacturing process, the large surface area crisline structure, retroactive of some of the nanoparticles may facilitate harm because of their insinuation of cellular material. Not even the EPA knows what impacts these things have, and yet we're preparing to let them loose in the City of Berkeley.

I think at least we should be asking for a discussion, and the people that may be impacted by these things right here in Berkeley, before we start signing off to allow something like that to be constructed in our community. Thank you.

MS. WAGLEY: Good evening. My name is Ann Wagley, and I'm a resident of Berkeley. And I'm not going to repeat the serious concerns of neighbors and environmentalists, and things that have already been said. Instead, I'm going to talk about money. It's interesting that Lawrence Berkeley Lab is envisioning its long range development as a hill town cluster. That is on page 10 of your NOP. Sounds very nice. And I'm sure it will be in this case for the people that work there.

Unfortunately, it costs a lot of money to run a town -- City of Berkeley knows this all too well. We are currently facing a severe deficit, and it's expected to grow thanks to the governor who was inaugurated today.

The City of Berkeley has to provide safe access roads to the Lab, street lighting for when you come and go from your hill down to the dark, sewer services for every

toilet and sink in your town cluster if a fire emergency happens. And the last is really serious, because we know the concentration of hazardous material at LBNL. These serving for you are paid for by the most part through property taxes paid for through us who live in this -- the town of Berkeley.

Currently the rate is 1.27 percent of increased value is one of the highest in the state of California, and we also pay a significant amount of money in the form of assessments, based on the square footage of your home.

I would like to suggest that the hill towns for the Lawrence Berkeley Lab levy on themselves similar taxes and assessments to pay them the city hall that provides the service that you use. These are commonly called pilot fees, or payments in lieu of taxes, and they are paid by governmental and institutional tax exempt entities to the host municipality, and that's done across the United States.

I strongly encourage LBNL to work with the City of Berkeley to find appropriate levels of payment for services both for current service to the infrastructure impacts, and also for those that are appropriate to the LRDP. We need to be fair here, and the hill towns or Lawrence Berkeley Lab need to pay their fair share. Thank you.

MR. SHIVELY: Good evening. I'm John Shively. I'm a Registered Professional Engineer.

I wish to speak in opposition to the siting of the proposed nanotechnology research facility in the Berkeley hills adjacent to and above the densely populated urban area.

My opposition is based on the problematic location, and not on the nature of the research work. The critical questions of research pertain to the important issues such as variable toxicity, contained problems, unintentional releases, substance propagation, dilution feasibility, biodegration feasibility, irreversible contamination recovery potential, and of particular interest to me is research site location. Because this is a relatively new field of science, many of the questions are not yet answered. However, site location is one we can address.

Although there are many unknowns of the -- about the conduct of nanotechnology research, one variable is to control where it can be done safely. That shall not be in the hillside above a densely populated area. There are many other potential sites in California that can be used that would pose a far less danger to population and the environment.

Nuclear weapons research originally conducted at the Berkeley Lab had a different kind of containment problem. A containment problem of a different sort. That containment of classified weapons information. And in the 1950's the weapons work was relocated entirely out of the Berkeley Lab and moved to the Navy Air Station on the eastern end of the Livermore

Valley.

When I worked at the campus, we learned that the source of the problem is Strawberry Creek. Water migrates westward from the hills towards the bay from the watershed above in and around the Lab out of streams, creeks, and trails. Much of this water comes from the Lab down Strawberry Creek under the stadium and through the city in route to the bay. Any accidental toxic release from there could eventually end up in Strawberry Creek and in the city's environment. This would be a genie that could not be put back in the bottle.

Let's not put the genie's bottle in the Berkeley hills. Thank you.

MR. MILLER: My name is Lowell Miller. I used to work at the University S.F. California in some context with the Lawrence Berkeley Laboratories. I will have the following suggestions for your evaluation. Regarding population, first of all, I think there should be an evaluation of the staff that's working at the Laboratory to see which -- if some of them can be moved at all. That is people that are not essential to the mission of the Laboratories and undertake things like either located off campus or telecommute. And in that sense, the second in succession followed would require management training of the senior staff all the way from the present downward, with regard to this telecommuting opportunity, since there is a general sense of distrust that the people who might be working from home might be goofing off. This would help, I think, reduce some of the transportation problems. Thirdly, all other functions that are not essential to the Laboratory's science of emission, like perhaps printing functions, things that could be outsourced, should be thought to move off campus so you can reduce the possible space, and perhaps to reduce the quantity of the space you would need. And fourthly, that is sort of the whole suggestion perhaps, there should be some sort of aerial tramway or some sort or transportation that's done to use to transport people from the location from the campus or whatever else, so they don't have to rely on businesses which are kind of the old technology. This may be sort of interesting. I think if those can be considered in the report, it might help reduce some of the other issues. Thank you.

MS. BERNARDI: I'm Jean Bernardi with the committee. I'm also a member of the Panoramic Hill Association. The Notice of Preparation for the Draft Environmental Impact Report for the Lab's long-range development will analyze the expected annual average construction rather than doing an Environmental Impact Report for each discrete project as it comes up in the future.

This is evasive and not acceptable. An EIR/EIS

must be done for each and every project proposed to be constructed landslide critical, fire season. This is the Strawberry Creek watershed. It's bad enough to work on the LRDP which was postponed for three years. So that too huge projects at Molecular Foundry would not be evaluated. The context of the long-range development plan where cumulative impacts could be thoroughly assessed. The Molecular Foundry must be postponed and evaluated under the LRDP as Tom Kelly has very well stated about POG principle. The City of Berkeley has adopted it, and do you respect to the residents of Berkeley and Oakland and it's employees?

The Lab should also apply the reductionary principle in determining what project should or should not be undertaken by the Lab. And therefore, every project that needs precautionary principle applied it as the LAN biosafety to Molecular Foundry devoted the nanotechnology. As I say, Tom Kelly covered that quite well. So, I'll jump over some things I was going to say -- and there are numerous experts and groups who have warned against rushing head long into nanoresearch. For instance, the ETC Group in Indiana dedicated the economic diversity government to adopt a moratorium on nanomaterials being produced in laboratories without testing for health and environmental impacts. The director of the center for nanotechnology at Rice University, Dr. Vicki Colvin, when interviewed in April this year, stated, "I'm anxious about when the first paper on health effects of nanomaterials publishes."

Mike Crow reported in February 2001, that all the mice in their experiment died, including those who had been immunized. This experiment was intended to sterilize the mice with mouse pox. That means the virus they created was on the loose, which is an immunization that does not exist.

Another concern at the Lab is the proposed proximity to the human geoinstitute is possible -- modified a little for which the health effects are unknown, and for which the Centers for Disease Control offers no guidance, which there are no known cures. Is that just a warning, or do I have more time? I'll finish later. Thank you.

MS. THOMAS: Good evening. My name is Janice Thomas, and I live in Strawberry Canyon.

I want to take this opportunity to not only address LBNL but also UC Berkeley Jennifer Lears is here. She took off. She left. Okay. And also the City of Berkeley -- I saw Grace McGuire back there, and anyone -- goodness, we're well represented -- and so I see areas of improvement in terms of strategic coordination between the City of Berkeley, but last year was such a terrible year for community people in terms of our -- all the projects that came around, and how blind sided we all felt, that personally, I'm still recovering, and I barely had so many feelings about it.

But I want to take this opportunity to try to be constructive about all this. For example, the watershed management plan. Before the meeting, I was talking with -- giving me more detail to some of the questions I had, and Pamela, and he mentioned there was 1,200 acres of the Strawberry Canyon wherein LBL can't really do a watershed management plan.

Well, I want to ask for the city of Berkeley to ask LBL and UC Berkeley -- since it's all UC land -- to come up with a watershed management plan. That's -- let's do that.

Another thing that is joint coordination. Rim Road, Centennial road, I don't know. Is that UC Berkeley Road? Or is that an LBL Road? But I can tell you that this additional population is going to have an impact mitigation, or is it going to be LBL's mitigation? Because I can tell you at the entrance to Panoramic Way, we're already experiencing really treacherous pedestrian conditions, because people get in and out of their cars there.

The third problem. There was a DTSV meeting the other night. I didn't see anyone from UC Berkeley at the meeting, and there really should have been, because one of the opportunities states the UC Berkeley LRDM and the DT was contaminated. And again, I'm a layperson that there is -- you know -- any way there should be again, joint discussions, and I hope community-wide discussions, and not behind closed doors. Although that's better than no conversation between the different academies, but still it's better, and joined to include the public. And then, finally -- well not finally -- I really have quite a long list -- the water upgrade projects, that's in the East canyon, that was a great opportunity that LBL just completely missed, where in fact the Panoramic Hill neighborhood that really suffers from lack of water. Literally, we do not have high grounds. That upper part of that hill should have -- that could have been an opportunity to provide water to this neighborhood.

The -- that's something that again, working with City of Oakland, the City of Berkeley you made your neighborhood much safer. So, thank you.

MS. CHACOS: Good evening I'm Ariatta Chacos with the City of Berkeley City Manager's Office, and I just wanted to say on behalf of my colleagues and myself, we have a number of us here taking notes trying to monitor what's going on with this. We're working on every opportunity we can to coordinate your operation and information, sharing both with this LRD and the UC Berkeley LRDP. And tomorrow night, the city council will be discussing this item with the LRDP for the Berkeley Lab. We encourage people to come in, listen to what the City Council has to say, and feel free to route any information request or comments you may have to our office, as well. Thank you.

MS. SEVALA: Good evening. My name is Pamela Sevala with the Committee to Minimize Toxic Waste, and I wanted to sort of follow up on the sentiment of Ms. Benson. There is another more sinister side to the Laboratories which is known to Berkeley citizens through newspaper articles. For instance, the San Francisco Chronicle article headlines "Berkeley Lab Found Research Fabricated-Scientist Accused of Misconduct Fired." Lab says -- date of -- again, the Berkeley Voice. This is October 3rd. "LBNL finds accounting to be sloppy. Lab scientist quits after investigation he transferred $3 million to accounts that he was not -- nobody knew about -- and also there is an audit going on regarding UC audit reveals many unbalanced accounts." And so these are very disconcerting issues. I think there should be a full comprehensive audit of the Laboratory. Not only of the fines, but also of the environmental conduct of the past 60 years. We have followed the problem for the past seven years. The final -- the Triton emissions have stopped, but the clean up -- there has been no treatment to the comprehensive clean up, and there seems to be real reluctance on the part of the Laboratory, although Ally Benson said we work on cleaning soil, contaminated soil, contaminated groundwater -- why not clean up your own site? Why don't you start there? Clean it up. Make it absolutely pristine as it was in 1940. And then, only then, start planning on building new hill towns on the site.

The Notice of Preparation, page 8, indicated that there are plans to increase the laboratory space by 1.2 million square feet. If you divide that by the square footage of Building 49, for instance, that would mean that there would be 18 buildings the size of Building 49 built at the Laboratory. I mean, this is a huge complex. Six story laboratory office buildings, and -- and I notice here none of these presentation materials indicated any kind of planning for the site. There was no specific land use maps, and I thought that was the reason why we were here to discuss specifically where these 18 to 19 buildings are going to go. And -- but there's no information, so I would like to suggest that the EIR have various maps that will show in detail where these buildings are proposed and their relationship to all of the major fault lines to the creeks to the springs, to the for -- to the landslide carries so that you can get a comprehensive picture of the site, as well as the areas of contamination. I think we need now after 60 years of operation -- I think we need a comprehensive analysis of the site and environmental audit as part of the LRDP EIR. Thank you.

MS. RAY: Good evening. My name the Lauren Ray. I'm an Independent Scientist. I worked five years at the Lawrence Berkeley Lab, and two years at the Lawrence Livermore

Lab, and three years ago I went to Hiroshima and Nagasaki, and saw the truth about what the University of California and the nuclear weapons labs have done to the health of the public globally, and to the health of the environment globally. And because of that experience I work now around the world on radiation issues. I'm also on the environmental economics counsel, and I'd just like to point out that in 2002 the global funding from government is around the world for nanotechnology was $1.5 billion. In 2003, the nanotechnology funding initiative for the United States was $700 million, and $500,000 was awarded for environmental impact studies. So you cannot tell me tonight or this year or next year that the Lawrence Berkeley Lab has any idea whatsoever what the environmental impact will be because you don't from the nanotechnology and I worked internationally with scientists around the world I just attended a conference in Florida on the health of the environment therefore organized by Russian scientists because Russia is a sick old man from radiation poisoning. 18 percent of the children in Russia are born mentally retarded because of the radiation and chemical pollution from their nuclear weapons and there you can clear power pollutions. Our health can be no better than the health of the environment -- we breathe the air. We drank this water. We eat the food from the soil -- that is part of your environment. And 1 out of 12 children today in the United

States have learning disabilities. What is that cause to our society? The nanotechnology -- I'd just like to talk about nanopathology. This is the laboratory in Italy. I just attended a conference on depleted urbanism deep in Afghanistan in Iraq. A scientist from Italy came and talked about nanopathologies ongoing to continue talking in the second part, because I would like to talk about that.

MR. CUNNINGHAM: My name is Jim Cunningham. I'm a resident of Berkeley and I have worked with the committee to minimize toxic waste. I usually don't talk about the science aspect of these issues, because I'm not a scientist, but I read the article -- this in the Chronicle -- on the Yucca Mountain Depository, and what amazed me about it was what the two groups of scientists were saying -- not a group of scientists -- and a group of nine scientists were saying it has been discovered that there are things that will happen in that depository which had not been known.

The second group of scientists are saying, number one, how can this research have been going on for as long as it has been, and you haven't known this? And the first group said, "Well, that's true." However, that means that the deposits are going to go into -- into the earth slower. The second group of scientists are saying that may be true, however, what else is going to happen that you don't know about? You didn't know about this. There is no reason to go ahead and use that

depository because there -- it is obvious to the second group of scientists that there are things that are going to go on there, and you don't even know what can go on. Immediately I thought of the Molecular Foundry because it's way out of line. I'm not a scientist, but I don't want that to be built until I have two groups of scientists sitting here in the room saying "yes" and saying "no." That's what I want to hear, and I don't want that building to be built until that information has been given to me and to the public. Thank you.

MS. CHACOS: Ms. Ariatta Chacos, City of Berkeley. I forgot to mention when I spoke before, that the city has made a formal request to the Lab to extend the comments for the NOP for the 14-day period, and that would put us somewhere around the 10th of December, absent the Thanksgiving holiday. So, it might be a few days after that.

We have heard back from the Lab saying that wasn't going to be possible. We are still going to keep calling and saying things at meetings and whatnot, that we would love to have another two weeks both for the city and for the community to weigh in on sort of the cumulative impasse, both of the Lab's long range -- with the UC Berkeley long-range development plan, so we would like just a little more time to think about this and respond more appropriately. Thank you.

MS. POWELL: Are there others who would like to speak? I know there were some people who had some additional things to say.

MS. BERNARDI: I just had a couple more paragraphs that I didn't finish.

MS. POWELL: Can I give you another three minutes? Is that okay?

MS. BERNARDI: I'm not sure I'll use it. So in regard to the Molecular Foundry by the nanotechnology Tri-Valley Cares, and Citizens Against the Radioactive Environment. In their newsletter, "Citizenwatch" have an article titled, "Bugs the Bombs." And that stated that the Department of Energy local neighbor security program has grown 115 percent to 87 million, since 9/11, and that this budget has been transferred to the Department of Homeland Security. Homeland security projects are planned for the Molecular Foundry. No classified research is done at the Lawrence Berkeley Lab. We wish to have a detailed description of all Homeland Security projected, the experiment proposed to take place in the Molecular Foundry.

The Department of Energy designs weapons for the Department of -- so-called -- Defense. I think it's more the Department of War these days. What we need elaborated in the long range development plan is how the Berkeley Lab's Molecular Foundry fits into an overall Department of Energy program for nanotechnology.

Shawn Howard, in his article, "Nanotechnology and

Mass Destruction. The Need for the Inner Space Treaty." This article is in the July-August Disarmament Diplomacy. I guess it's a journal that warns of the dangers of new types of weapons of mass destruction emerging from the development of nanotechnology. I think that that's a concern that we have because we know that the Lawrence Berkeley Lab, although it's said over and over, they're not doing any weapons research, that's not true, because they were involved with the Dart project, which was making something at Las Alamos. I think it was for simulated nuclear bomb attempts. And the defense part of the contract with UC has increased in the budget, so these are definitely concerns that we have, particularly when -- when -- think about the facts that the Molecular Foundry is going to be a user facility, and it's really hard to imagine how you would ever adequately provide oversight for all of the things that might take place in the Molecular Foundry.

As I was saying, this is a laboratory in Italy using nanopathologies, and -- I just think that if they're concerned in Europe with nanopathology that we should be too, and I have haven't heard any mention from the Lab about the actual environmental impact or health impact of that technology. I've heard nothing but that it will ever have any impact, and clearly from the funding that's been allotted for Environmental impact research, there's been none done.

I know that in a study on rats that were exposed to nanoparticles, half of them died immediately after exposure, being injected with nanoparticles. Their tubes were just completely plugged up. And on -- I am also very concerned by the interaction of nanoparticles with radiation and just exactly how the Lab proposes to do nanotechnology in a radioactive environment.

The Bay Area, especially Berkeley, is extremely polluted with radiation. You cannot do nanotechnology in a radioactive environment because the radioactive particles damage the atoms which are the building blocks for nanotechnology.

In May, Pamela Sevala and I attended Drexler -- who is the father of nanotechnology -- conference in Palo Alto, and the hazards of radiation and the need to do this. A radioactive-free environment was discussed. I actually became the citizens' scientist, the whistle blower at Livermore in 1991. Plus, I was working on the Yucca Mountain project, and the extent of the science fraud in the most important public project -- public works project in U.S. history, which is what to do with all of the radioactive waste is why I walked out one day and became a whistle blower. And I'm telling you that is in the most active region in the United States. It is built in a volcanic region of water under that repository -- the hot springs -- which indicates volcanic activity, and it's just the last stop for the trash from the nuclear weapons in

the nuclear power projects. And we will find down the road that genetically modified organisms in food and nanotechnology will be part of a similar pattern of science. So, I don't think that the Lab knows enough about nanotechnology to undertake this project.

This is a parliament report on low level radiation. It was released in January. I've been all over the world with this report, and just the nuclear -- the -- the nuclear power programs long have been, or will be responsible for the death of 60 million people globally -- 2 million babies, and 1,600,000 unborn babies.

I think we need to remember the precautionary principle now more than ever. Thank you.

MS. THOMAS: Janice Thomas. In the comment by Sally Benson -- where is she? You mentioned the context -- the mission. And one of these was to address the fundamental nature of the universe and to house national user facilities. And these are all very important. I agree with you. But I would hope too, that this long range development plan really speaks to what this DOE laboratory can give back to the local community. And by that, I don't mean just science fairs, and "Nano High," and open house days, but I mean really what can this lab give back to the community?

Certainly my -- one of my concerns is that this canyon be preserved to a greater extent as the natural environment. And when I say greater extent, greater extent than what has been currently contested by LBL and UC Berkeley.

But I also think that there's an opportunity here for again, UC Berkeley and LBL to look at the health effects of this. That these labs research has had on the neighboring community. This has been going on for decades, and we do have a Department of Public Health in at UC Berkeley, and certainly, I can promise you that if this lab doesn't take this initiative, that myself and many other people will begin to start lobbying very heavily, and hopefully effectively, to get the UC regents to take greater responsibility for the health effects. I just don't mean a simple risk assessment that looks at cancer. I'm talking environmental medicine.

There's a genome institute at the Lab. I would love to have my DNA looked at. I would love to have Mike Conway, and -- really look at these things for the local community.

You know, I know people who have grown up in the hill. I know myself just there 17 years, I don't know if my joint ailments are environmentally related or not, but I essentially would like there to be that kind of stewardship. And for this laboratory to take it as the submission to give back in a real substantive way, and to make itself part of this community, because I think everyone of us believes the science. I mean, really. And it's the management that is concerning. It's the management and administration. That's

something that I believe all good people in good faith can work towards. I know you shall.

MS. SHIMMERLING: I'm Carol Shimmerling, and I am with the Earthquake Council. We are very concerned about the way the Lab has managed the creeks on their facility, and the way they intend to manage it if they're going to have as much development as they say they're going to have. We're very interested in doing work in the East bay, in particular, that we hope will spread around the state as a state-wide organization. We are doing surveys of the upper watershed, the original streams that feed into the streams that go into the bay. These lead water streams are greatly important to the health of the whole system, and when they are damaged, and when they're polluted -- the whole system is there in an urban environment. There's no way that this can be cleaned up when so much of the water goes through culverts, concrete channels, and other none biologically-sound environments.

So, this is a great concern for us. But now as a citizen, I have to say that it was a horrible mistake that anybody ever built that Lab in the first place on these hills. And now that they're there, there's no real reason to continue to make it grow. It's time to start downsizing, and particularly in the light of some of the problems that people have already mentioned about the way the Lab is being run, and its representation amongst their peers, elsewhere. It's time, in fact too, that the Lab stop doing research and having user facilities, and it's time that went back to the original theoretical work that they ostensibly were supposed to be doing. If that doesn't happen, none of the measures that you claimed you will take, will really make much difference in preventing accidents, both health and safety. Nowhere have you mentioned what you're going to do with the growth of eucalyptus trees that's filled with . You haven't said anything about pollutants in Chicken Creek. None of the things that are really problems that you have created have been mentioned. I find it astonishing. I mean, it's like listening to Bush and Cheney. Everything's fine, folks. Don't worry about a thing. We're all going to take care of it. Just give us all your money.

So, I don't believe that you know what you're doing, quite frankly. I'm sorry to say this. You're all nice people. But we all make mistakes. We're human. And in fact, I don't believe that you have any idea of what the consequences are of your 20-year program, and I think the consequences are not going to be beneficial to either the people that live here or the environment.

MS. SEVALA: I just -- well, a question just to follow-up on Carol. It isn't meant -- I think she is very very right. And I have another newspaper article from the Berkeley Voice, July 19 2002, which is related to the fact

that the Department of Energy did not renew the contract with the UC to manage the Lawrence Berkeley Laboratory. And I would like to find out what the update is. Is there a contract currently for the management of the Lab? Did the Department of Energy provide a new contract? And basically, the reasons why the Department of Energy had not made a decision, at least as far as I know, as of today, unless you tell me otherwise. Is the fact that at the highest level of management they're considering whether to extend or compete, so it would be important for the community to understand what is the status of the laboratory's contract? And indeed, if the Department of Energy is not going to be renewing it, what will be the future of the laboratory? And what is the relevance of all that to this process tonight? Thank you.

MR. KELLY: I wasn't going to say anything else, but Carol Simmerling got me all worked up. I brought a couple of things in mind. You know, in one thing I just wanted to sort of caution us about is first of all, I don't think that everything that these folks that study nanotechnology are interested in are all bad. There probably are some good things that might one day come out of it, but it would be -- might have that conversation with all of us. But one of the things that I notice is that the proponents of nanotechnology make arguments like, this will revolutionize or aid to bring medicines to all the poor of the world. That we will be able to clean the water everywhere. That we'll -- and it just goes on and on. There are all these social benefits that they use in order to sell us on this idea that nanotechnology is a good thing. And I hear the good folks here from the lab saying -- and that they -- you know -- one of their parts of their mission is to improve human health in the environment, that kind of thing. But there's always that element in there about fueling as well, and that is the thing that I want to warn us about, is that unless these things have some economic benefit to someone, they're not going to be distributed, and how do we know that? The pharmaceutical companies thoroughly refuse to distribute in places where people are dying by the millions, and why? Because they can't get enough money for them.

We can talk about the automobile industry. One of the benefits of the nanotechnology will be to make things smaller, more efficient and everything. But automobile manufacturers won't make their cars fuel efficient. They have the technology, but they fight these standards tooth and nail. They haven't changed since, I think, 1982. So, with all the SUV's we're selling, the average fuel economy is going down for cars.

I just put that out there that when you try to explain to us that the world is going to be a far better place after of this, you might want the take that with a grain of

salt. That's it. Thank you.

MS. STOUFFER: Molly Stouffer. I work at Lawrence Berkeley Lab. But I'm not here to talk on behalf of my employer. I just wanted to share a few of my own thoughts and my own views about this. Can you hear me now? Anyhow, my name is Molly Stouffer. I work for Lawrence Berkeley National Lab. I'm not a scientist. I can't speak to any of your scientific concerns, except perhaps that I do work for one of those neighborly user facilities I think do -- do fundamental research about the nature of the universe and about those fundamental concerns that the laboratory's done its research, what 60-odd years ago. That research is still done. That is still the purpose of the laboratory as Dr. Dennison said, and that is what those user facilities are -- you know -- there for. People not just from our community, but from anywhere in the world do research at these. I would hope in the laboratory's long range development plan that they do address and maybe plan to mitigate traffic concerns. The corridor along Panoramic Way is saturated. And as good neighbors we need to -- we need to do something about that. We need to mitigate that. The watershed is an important thing and I hope, again, that the laboratory makes whatever efforts to -- to be a responsible steward at the watershed. And to -- to place a high value on that. That's not a -- a resource that could be rebuilt or that could be recreated. But I have faith in the people that I work with, and that I know them, and I have faith that they are responsible stewards, and I hope that they will work with the community on these issues, because I hope that the science and the achievement that I value in the place -- you know -- are something that can be important enough to the community, and that we can give back to the community and really, really research out and really do something of substance for them, too.

MS. SURNEY: My name is Susan Surnay, and my husband is a Research Scientist at the Lab, and Professor of Nuclear Chemistry on the campus.

The lab was unfortunately placed on the hill to begin with, and I think at some point, like with the campus, there's got to be some off-loading from the hill. I mean -- I don't want to repeat myself.

My name is Susan Surney. My husband is a Research Scientist at the Lab, and has been for 40 years, I think. And is a Chemistry Professor. And he's a Nuclear Chemist.

I'm also a preservationist, as maybe some of you know. I -- the Lab is in an unfortunate location to begin with. It should never have been built there. And too, because it's on a hillside and a watershed -- but it is there. But it doesn't have to keep growing. It just simply doesn't have to. That doesn't mean that the research has to stop. It just means that it needs to be off loaded somewhere else.

Because you just can't keep building up there. And the juxtaposition of the campus and its needs and the LBL, and it's needs are too much for the downsizing environment. And I think that serious consideration should be made of alternative sites. There is the Richmond Field Station, which somehow the University and LBL don't want to go out there too much. But at -- and the thing about the Professor and the grad students, and the research, and the sharing of -- you know -- the two entities is actually not as great as it had been in the past. And so I think some of it should be put offsite. Thank you.

MS. POWELL: Are there any other comments? Janice Thomas.

MS. THOMAS: Janice Thomas, again. I just hope that this document somehow addresses why this site shouldn't be used for housing for UC Berkeley students. I've said this before, but again if we take the UC focus instead of UC Berkeley and LBL -- to me, the question needs to be answered as to why the research can't be done more offsite, and what was peculiar -- or particular about this location that mandates that this research should continue at the site, when in fact, I think a very logical argument can be made that approximate housing for UC students would be of greater value.

MS. MORGAN: My name is Sara Morgan, and I work at the Lab. And I just wanted to kind of bring to the table that not only does the Lab have a responsibility to the community, but the community has a responsibility to the Lab.

A large portion of the population of the Lab are community participants. They either live in the nearby communities, or drive through the communities. They contribute to the communities in some fashion or another. And as a result, it's not that the Lab needs to give, give, give, and the community does not also participate in the conversation in that. We provide emergency service to the communities. We provide jobs. We provide tax -- well, consume taxes; but so do you. So. It's a give and take situation. And as long as we can keep an open dialogue about what the various needs are, I think you're more able to have a good conversation, and have your needs met. I think if you want to mitigate traffic, great. How do you subsidize mitigating traffic? It's fine and good to say take public transit, but when it's more affordable to drive your car up the hill, I'm going to drive my car. I'm not going to take the bus. I'm not going to take BART. Why would I? It's more expensive to take either of those options. Make it more affordable to take the bus, and I'll take the bus. I am also -- how many of the people who work at the Lab also live in Berkeley and drive right up the hill themselves? You know, we have 4,000 employees. If even 50 percent of those live in Berkeley -- 50 percent. How many of those people are driving up the hill themselves? If you're not starting within your

own community, you can't very well expect another institutions to follow through and honor what you're saying. You have to talk the talk and walk the walk.

I'd just like to say something as the scientist did about who this laboratory is going to benefit. Scientists serve the military, and scientists serve corporations. And the people who are going to benefit from the research of that laboratory, and the application or misapplication are going to be the military and corporations. And unless they can make money, unless they can benefit, we're not going to. So I think we need to keep that the mind. Nanotechnology, weapons, even research on fourth generation nuclear weapons is what is underway now, to where billions, and billions, and billions of dollars are being poured into now. This is why more than 30 world-class microbiologists have been murdered in the last year and a half. They were all working on DNA specific bio weapons. We invited Professor Ignacio Chappela to speak in the Berkeley City Council and at the public meeting he told us spermicidal corn is being tested in Mexico now. I believe Novartis developed it. Who will that spermicidal corn be used on? Is it people with brown skin? He said, "Well, we don't know." So who gets to make the decision on the application or the misapplication? Who gets to make the decisions on the application or misapplication of biotechnology? It's not us. It's the military, and it's corporations. They're destroying our lives, our environment, and our health. We need to make the connection: Where is the money coming from for this research, and who will decide what the applications are? Thanks.

MS. POWELL: I think we're done. Thank you very much for coming tonight.

(OFF THE RECORD, 8:55 PM)

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APPENDIX B

LRDP Principles, Strategies and LBNL Design Guidelines

I. LRDP Plan Principles

Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship.

As a leader in energy and environmental research and the stewards of this extraordinary site the Laboratory has an opportunity and responsibility with each new project to be a model for environmentally responsible development. Construction of new facilities will take place on land within already developed areas of the site to allow undisturbed open space to remain at the site's perimeter. Sensitive habitats and riparian areas are protected and stands of screening trees will be protected and expanded to screen views to Laboratory buildings from all directions.

New buildings will be constructed to meet or exceed the UC Presidential Policy for Green Building Design. Whenever possible, new building elements and/or design strategies developed by University of California researchers will be showcased in new projects as a way to reinforce a "culture of sustainability" at Berkeley Lab. All of this will be done in a way that enriches the unique sense of place that is Berkeley Lab.

Build a safe, efficient, cost effective scientific infrastructure capable of long-term support to evolving scientific missions.

Life Safety is a top priority at Berkeley Lab. New facilities will provide state of the art protection against potential occupational hazards and will address the two natural hazards common to the East Bay region—wildland fires and seismic activity. Future development and landscape improvements will continue and strengthen the Laboratory's existing fire protection and vegetation management strategies that have served as a model to the region. The replacement of older facilities with new ones built to modern life safety standards will significantly reduce the threat to life safety in the event of fire and earthquakes as well as the potential occupational hazards of scientific research.

The efficient, long-term operation of a research institution where scientific needs are constantly changing is a challenge that demands a high degree of flexibility in the way new projects are planned and designed. Accordingly, the Plan provides the flexibility needed to meet both known and unforeseen programmatic needs in a cost effective way without compromising the environmental assets of the site.

Operational efficiency is also strengthened by bringing researchers and their programs closer together. Whenever possible, new projects will be located in close proximity to facilities with common activities and/or related research interests to capitalize on the benefits of collaboration and shared use of specialized equipment and facilities.

Build a more campus-like research environment.

Berkeley Lab's scientific endeavors rely on the healthy exchange of ideas sustained through formal and informal social interaction among scientists, engineers, students, and support staff. To build an environment that fosters this valuable social interaction, the design of new Laboratory projects will draw inspiration from university campus type settings. Future development at the Laboratory will place an emphasis on the pedestrian experience both indoors and outdoors to create a setting conducive to interaction and collaboration.

New projects will be planned to segregate pedestrian and vehicular circulation. Buildings, built at greater densities than they are now, will better define outdoor spaces between them. Future development will build upon the informal character of the Laboratory and lead it in a direction where buildings are not thought of as individual objects, but work in concert to weave the Laboratory site into a coherent whole.

Improve access and connections to enhance scientific and academic collaboration and interaction.

As the Laboratory takes on new challenges it will increasingly rely on the rapid innovation that emerges from interdisciplinary collaboration. Whether at the scale of individual researchers, or a consortium of public and private institutions working together, clear and convenient access to and around the Laboratory is vital to the work and culture of team science at Berkeley Lab. The Laboratory is committed to providing access in the safest, most environmentally responsible way possible. In 2006 nearly half of the Laboratory's adjusted daily population commuted to the main site on its shuttle system which has connections to UC Berkeley and regional mass transit systems. New and improved pedestrian routes will provide safe and direct linkages between on-site shuttle stops, facilities, and parking. The improved walkways will offer an outdoor amenity that not only provides a sense of connection to the natural setting and views but also promotes chance meetings along the way.

II. LRDP Planning Strategies

Land Use Plan Strategies

The Land Use Plan will guide future planning decisions; it has been configured to manifest four strategies that derive from an appreciation of the site's existing assets and constraints, the Laboratory's scientific vision and goals, and the planning principles that underlie this LRDP.

- Protect and enhance the site's natural and visual resources, including native habitats, riparian areas and mature tree stands by focusing future development primarily within the already developed areas of the site
- Provide flexibility in the identification of land uses and in the siting of future facilities to accommodate the continually evolving scientific endeavor
- Configure and consolidate uses to improve operational efficiencies, adjacencies and ease of access
- Minimize the visibility of Laboratory development from neighboring areas

Development Framework Strategies

The Development Framework defines the rationale for where and how new development should occur within the zones defined in the Land Use Plan and provides a means to implement these six strategies:

- Increase development densities within areas corresponding to existing clusters of development to preserve open space, enhance operational efficiencies and access
- To the extent possible, site new projects to replace existing outdated facilities and ensure the best use of limited land resources
- To the extent possible, site new projects adjacent to existing development where existing utility and access infrastructure may be utilized
- Create a more "collegial" environment that encourages and facilitates interaction among the variety of Berkeley Lab employees and guests
- Site and design new facilities in accordance with University of California Presidential Policy for Green Building Design to reduce energy, water and material consumption and provide improved occupant health, comfort and productivity
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Laboratory

Vehicle Access, Circulation and Parking Strategies

The Vehicle Circulation and Parking Framework is based on a series of strategies designed to improve transit, access, circulation, parking, and safety at the Laboratory.

- Increase use of alternate modes of transit through improvements to the Laboratory's shuttle bus service
- Promote transportation demand management strategies such as vanpools and employee ride share programs.
- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates
- Create a better linkage between parking, shuttle stops, and pedestrian circulation on site
- Provide separated routes of travel wherever possible for pedestrians and vehicles
- Promote use of bicycles by providing additional storage racks and shower facilities

- Eliminate parking from the sides of major roadways, thereby improving safety and allowing one-way roads to be converted to two-way traffic
- Maintain or reduce the percentage of parking spaces relative to the adjusted daily population
- Consolidate parking into larger lots and/or parking structures; locate these facilities near Laboratory entrances to reduce traffic within the main site
- Remove parking from areas targeted for outdoor social spaces and service areas
- Consolidate service functions wherever possible in the Corporation Yard

Pedestrian Circulation Strategies

The Pedestrian Circulation Framework incorporates the following strategies:

- Use pedestrian routes to connect the various developed terraces of the site which host the central and research clusters
- Improve the pedestrian spaces at the heart of the research clusters and adjacent to research facilities so as to support interaction among Laboratory users
- Separate pedestrians and vehicles whenever possible
- Retain and improve walkways as appropriate throughout the open space portions of the site, carefully integrating these pathways to minimize intrusion in the natural environment
- Improve pedestrian access and safety throughout the Laboratory site by developing new routes and enhancing existing routes
- Improve wayfinding through a comprehensive and coordinated signage system and through the naming of buildings and research clusters
- Improve the path providing access to and from the UC Berkeley campus

Open Space and Landscape Strategies

Both the Open Space Framework and the Landscape Framework are based on strategies that aim to preserve the environmental quality and enhance the overall experience of the Laboratory main site.

- Preserve and enhance the native rustic landscape and protect sensitive habitats
- Develop new campus-like outdoor spaces such as plazas within clusters of facilities and improve those that already exist
- Maintain and enhance tree stands to reduce the visibility of Laboratory buildings from significant public areas in neighboring communities
- Improve the overall appearance and experience of the Laboratory through improvements to the main entry gates, and the landscape areas associated with roadways, parking lots, and pedestrian pathways
- Continue to use sustainable practices in selection of plant materials and maintenance procedures

- Develop all new landscape improvements in accordance with the Laboratory’s vegetation management program to minimize the threat of wildland fire damage to facilities and personnel
- Utilize native, drought-tolerant plant materials to reduce water consumption; focus shade trees and ornamental plantings at special outdoor use areas
- Minimize impervious surfaces to reduce storm water run-off and provide landscape elements and planting to stabilize slopes, reduce erosion and sedimentation

Utilities and Infrastructure Strategies

The Utilities Framework incorporates the following strategies:

- Maintain a safe and reliable utility infrastructure capable of sustaining the Laboratory’s scientific endeavors.
- Consolidate utility distribution into centralized utility corridors that generally coincide with major roadways
- Ensure that utility infrastructure improvements accommodate future facility expansion and alterations in the most cost effective means possible
- Design infrastructure improvements to embody sustainable practices

III. Berkeley Lab Design Guidelines

The following LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following the Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP’s development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The LBNL Design Guidelines provide specific planning and design guidance relevant to new development to achieve these design objectives.

The Land, Topography and Views

The landscape of the Lab is divided conceptually into five broad categories, as defined in the LRDP: Screening Trees, the Rustic Landscape, the Rustic Riparian Landscape, The Ornamental Landscape, and the Significant Ornamental Landscape.

Objective: Provide screening landscape elements to visually screen large buildings

- The large stands of screening trees at the Lab provide critical visual screening of facilities and operations. Tree stands that provide important visual screening, as well as zones identified for new stands of trees, have been identified in the LRDP.

- Whenever possible new plantings will be introduced to provide visual screening for future building sites, where shown on the LRDP Landscape Framework Map.

- Every effort to preserve important screening trees (as identified) will be taken when siting new facilities. In the event that screening trees must be removed for new projects new plantings of a species with adequate density, height and life-span will be strategically located as to provide visual screening of new and existing facilities.

- New screening tree species shall be compatible with the tree species already existing at the Laboratory**.**

Objective: Projects or portions of projects which fall within the Rustic Landscape zones identified on the LRDP Landscape Framework Map shall provide new plantings consistent with this zone.

- The Rustic Landscape is the natural setting of the Oakland and Berkeley Hills that the Lab as a whole sits within. This landscape zone forms an important perimeter buffer for the Lab as well as dividing belts between Research Clusters.

- Plant palettes for new plantings within the Rustic Landscape Zone shall be of species native to the bay area costal range. The plant material should be drought tolerant, non-invasive and low maintenance.

Objective: Projects or portions of projects which fall within the Rustic Riparian Landscape zones identified on the LRDP Landscape Framework Map shall provide new plantings consistent with this zone.

- The Rustic Riparian Landscape is those portions of the Rustic Landscape that have riparian habitats. These areas are identified on the LRDP Landscape Framework Map and are in many cases protected from development.

- Plant palettes for new plantings within the Rustic Riparian Landscape Zone shall be of species native to the bay area costal range. The plant material should be drought tolerant, non-invasive and low maintenance.

Objective: Within the Ornamental Landscape zones identified on the LRDP Landscape Framework Map provide new plantings consistent with this zone.

- The Ornamental landscape zones at the Lab are the areas of landscaping in and immediately around the Research Cluster development areas. Here a more ornamental palette of plantings can be used that is intentionally distinct from the Rustic Landscape.

- Plant Palettes within the Ornamental Planting Zones shall consist of ornamental trees, shrubs, and groundcovers planted within the commons area and in visual proximity to pedestrian walkways and parking lots.

- A comprehensive planting plan will assign a unique palatte to each developed cluster and special places like Laboratory entries and the Cafeteria Commons. The planting plan is intended to provide enhancements for the grounds, visual screening and orientation.

Objective: Provide a special feeling of arrival at Significant Ornamental Zones using distinctive landscape plantings and elements

- A handful of areas at the Lab have been identified as locations where significant, special planting and landscape treatments should occur, including the entrances to the Lab and the two major public commons spaces (see LRDP).
- Plantings and landscape treatments within the Significant Ornamental Zones shall be of a special, highly-designed nature.

Common Landscape Elements

Objective: Create a cohesive identity across the Lab as a whole by following established precedents for new landscape elements

- Landscape elements common across the Laboratory such as signage, lighting, outdoor furniture, fencing and visual screening shall be designed to provide a cohesive identity across the laboratory.
- To improve orientation and wayfinding, site-wide design themes for landscape elements may vary to express the identity of each Research Cluster.
- Special attention will be given to environmental art installations across the Laboratory site. Installations will enhance the experience of the Laboratory while providing practical assets that screen views to service areas, enhance wayfinding, provide walkway and retention structures.

Objective: Provide appropriate Site Lighting for safety and security

- For all new projects lighting of streets and parking lots will provide the necessary light levels to ensure safety and security while limiting impacts to the neighboring land uses.
- Pathway lighting will only be located on pedestrian spines connecting major commons areas and within commons areas. Use low height bollards of a design compatible with landscape design themes.
- Unique lighting treatments should be provided in selected areas of the site. These include the main entry gates, critical arrival points, landmarks and service entries. Site entry lighting will only be used to light the identity signage at the Blackberry and Strawberry Gates. In maintenance yards and equipment lay-down areas lighting may be pole mounted. All lighting will be cut-off type lighting designed to contain light in the work area without "spillover."

Landforms, Buildings, and Massing

New projects will be sited and designed to minimize the impacts to the existing hillside terrain and to minimize visibility from other parts of the lab and from surrounding communities.

Objective: Minimize impacts of Disturbed Slopes

- To the degree practicable cut and fill slopes will be minimized. Cut and fill slopes exposed to view shall be promptly restored, using best management practices to minimize erosion.

New vegetation should be planted in a manner to return the visual quality of the slope to a condition similar to its original state or better.

- Building footprints shall be designed with long-narrow aspect ratios in parallel to natural terrain to the degree consistent with program needs.

Objective: Create landform elements consistent with design on the Hill

- Given the dominant hillside site conditions of the Laboratory, site retention structures are a pervasive design element in the landscape. Design and placement of site retention structures shall integrate with the design of adjacent buildings and commons areas. Where possible retention structures should be used to minimize the impacts of new fill slopes.

Objective: Mass and site buildings to minimize their visibility

- To the degree feasible, the massing of new buildings will be configured to minimize their visibility when viewed from equal and lower elevations, and to complement the hillside terrain.
- Large buildings shall be designed to reduce their perceived mass and impart a human scale to the site. Buildings with a horizontal dimension greater than 200' or a vertical dimension greater than four stories shall incorporate changes in both façade plane and vertical height to reduce its perceived scale and bulk.
- Building heights for all new buildings are typically limited to four stories. However in locations where the site's topography creates a natural backdrop or provides appropriate visual screening building heights may be increased. New buildings shall conform to the height limits indicated on the building height map.

Objective: Screen Roofscapes

- Rooftops of Laboratory buildings are highly visible to residents and institutions at higher elevations. Attention shall be given to the design of rooftop surfaces and elements to minimize the visual impacts. Building and research support equipment shall be rooftop mounted only when required for the proper operation of the intended use of the equipment such as ventilators, lab vent stacks and scrubbers. Visual screening devices shall be used to screen views of such equipment from public view points at higher elevations. Rooftop screening devices and equipment shall be designed as elements integral to overall building design themes.

Objective: Respect View Corridors

- New buildings shall be configured as to preserve valuable distant views from commons, courts and key public spaces within neighboring buildings. Attention shall be given to create special "framed" and foreground views between pedestrian spaces that provide visual interest and orientation.

Objective: Integrate buildings into the overall landscape using appropriate materials

- The palette of exterior building materials allowed for new buildings shall be of a color and texture that integrates well with the natural environment and is consistent with the most durable and cost effective building assemblies for laboratory and office buildings.
- The base of new buildings—where building forms, slope retention structures, and outdoor plazas meet the hillside terrain—shall be cast in place or pre-cast concrete of a natural color and a texture consistent for base elements.

- Exterior wall materials will primarily consist of, but not be limited to, concrete, metal panel and glass curtainwall systems with featured accents of stone, wood and tile where appropriate. The color and texture of these materials shall integrate with the natural surroundings to reduce the visibility of buildings in distant views. A consistent palate of color and texture will be used to ensure a cohesive image and enhance orientation. Highly reflective materials and elements shall not be allowed unless they are deemed necessary to support mission needs.

Research Clusters

A key element of the Conceptual Framework established to guide development at the Lab is the concept of the Research Cluster. The Lab has been conceptually divided into six discreet Research Clusters – concentrated, dense developments of research buildings, each having its own subtly unique character and social structure. The creation of these Research Clusters will help to fulfill two of the four basic principles contained in the Vision of the Laboratory site and facilities;

- **Build a "campus-like" research environment**—one with a coherent development pattern and image conducive to team science; and
- **Enhance scientific and academic collaboration** with public and private initiates by improving access and connections.

Research Clusters will develop over time as the aggregate result of multiple development projects. It is important that each development respect the long-range development concept for each cluster and build on the efforts of its predecessors to work together towards a common, coherent goal. There are a number of fundamental parts of the Research Cluster concept.

The Commons

In order to encourage informal interaction within each Research Cluster, activities and new development in each Cluster will focus on a central campus-like collegial space called The Commons. Analogous to how a town square functions within a civic community or to a quad in a campus community, the Commons will form the social heart of each Research Cluster, creating a strong focal point, gathering space, and Sense of Place. Each Commons will have a unique scale, configuration, and character, depending on existing conditions and development scenarios.

Objective: Create new Commons Spaces in clusters that currently lack them

- New building sites and locations of new Commons Spaces shall be defined by Lab Planning, and new projects shall conform to the given footprints.
- New buildings shall be located and designed to create well-defined, campus-like pedestrian commons and courts between buildings that provide pedestrian access to buildings.

Objective: Stimulate pedestrian activity and interaction in the Commons Spaces

- Building facades facing commons and courts should provide exterior building spaces such as covered porches at main entries and covered walkways to provide exterior places of interaction weather protection.

- Major entrances to buildings shall be located on the Commons space when possible, or on major pedestrian routes where not possible.
- Seeing one's colleagues at work is an important stimulus to interaction. Therefore, the ground floors of buildings enfronting Commons spaces shall be made as transparent as possible to create a visible connection between inside and outside.
- Social and collegial spaces such as lounges, informal meeting spaces, journal rooms, etc shall be located either directly off of or overlooking commons spaces and shall be visible and made prominent from the outside.
- The use of arcades or covered walks where buildings form the edges of commons spaces shall be considered.
- Outdoor commons, courts and pedestrian pathways will have a hard surface appropriate to their function. Special outdoor spaces will feature patterned concrete and or brick inlay in a design consistent with building design themes. Pedestrian pathways are currently and will remain paved surfaces. Joint detailing and saw cuts may be used as a cost effective method of providing scale to these surfaces. Where possible permeable surfaces such as planting pavers shall be employed to increase the permeable surface areas in parking lots and plazas.

Objective: Allow light to reach the Commons Spaces

- Buildings facing outdoor commons shall be scaled to admit sunlight and impart a comfortable human scale to these places. Additionally, new building massing shall be configured to allow solar access for adjacent buildings to the degree feasible.

Objective: Create as high a density and critical mass around commons spaces as possible

- Buildings shall be massed with their greatest population density in proximity to the Commons spaces.
- Buildings within Research Clusters shall be built to as great a density as possible within the allowable development envelopes.

Identity

Each Research Cluster, because of topography, historic buildings, plant palette, and so on will develop a unique identity.

Objective: Create new Keystone Structures in clusters that currently lack them

- Over time, each developed cluster shall include a "keystone structure" the most visually significant structure in the cluster. Keystone structures will typically be the largest building in the group of buildings and will feature building elements of a scale and design that signify the unique character for the cluster to reinforce identity and orientation.

Objective: Utilize artifacts to create identity and add interest to each Cluster

- There are many interesting historic objects scattered around the Lab. These artifacts are important reminders of the Lab's legacy as well as items of interest which stimulate interaction. Placement of these artifacts at major pedestrian nodes and at prominent locations in each commons is encouraged.

Objective: Create consistency between buildings in individual clusters.

- Designers shall examine the architectural precedents, especially of historic buildings, present in the Research Cluster where their project is to be located. A clear rationale based on precedent for the architectural expression of each project will be developed.

Function

Objective: Segregate public entries and paths from service entries and paths where feasible

- Main building entries and service entries will be clearly separated. Main building entries shall face onto pedestrian spaces with common access to other buildings.
- Building entries and plazas shall be distinguished as a place by design treatment- paving, lighting, furnishings and shall incorporate provisions for disabled access.

Objective: Where segregation is not possible, and service and public access overlap in accessing buildings, design service courts to intelligently serve both

- Pathways to main entances shall be clearly marked and protective measures for pedestrians shall be designed.
- Multi-use pedestrian and service access courts and routes shall be designed to slow vehicle traffic using articulated paving, bollards, or other devices.

Objective: Develop Research Clusters in a way that is mindful of future expansion

- Identify and reserve areas for future expansion on each building project.

Linkages

The Hill Site is characterized by its steep topography which creates separate research clusters located on a series of hillside terraces and ridges. The topography is such that one can never get a comprehensive view of the place. Rather, one’s experience of the site is defined by the movement from area to area, from terrace to ridge to valley. Views are constantly shifting, changing, and opening anew. The pathways that link various areas together, both vehicular and pedestrian, are important linkages, both for the experience of the place and for encouraging people to move from place to place, to visit, and to explore. The design guidelines in this section are intended to ensure pedestrian and vehicular access is provided in a way that creates a campus-like experience unique to the Lab while providing safe and efficient access to all Laboratory facilities.

Pedestrian Access

The Hill site is an intricate network of stairs, roads, and paths that negotiate the steep topography of the site. As each new project is developed adjustments may be made to the existing network of pedestrian pathways as necessary to provide direct access between each cluster commons, parking lots and Laboratory gateways.

Objective: Design Pathway Layouts that support pedestrian flow and encourage casual interaction

- Development of new pathways and improvements to existing ones shall provide a natural appearing unobtrusive network with structural elements artfully placed and designed as landscape features.
- Pedestrian pathways providing access between cluster commons currently, and will continue to vary in width. The main pedestrian spines, between major commons areas shall be constructed of a width of approximately 8'-0" allowing two pairs of pedestrians to pass comfortably. Pathways along roadways and between all other commons areas shall remain at their current width.
- Pathway intersections, view platforms and stair landings provide opportunities for outdoor interaction spaces. The design of new walkways shall incorporate such spaces to the extent possible.

Objective: Materials utilized in walkway construction should be appropriate for their location and intended use.

- Material choices for walking surfaces may include, but are not limited to asphalt, stabilized aggregate, concrete pavers and patterned/colored concrete. Within new projects Pathway materials and colors shall be consistent with surfaces provided in commons and plaza areas.

Objective: Construct new walkway structures such as stairs, bridges, slope retention for walkways and guardrails of materials compatible with the surrounding landscape

- Use concrete, wood or core-ten steel.
- Design themes for these structures should be coordinated with adjacent building design themes, designs for shuttle stop shelters, signage and lighting to provide a comprehensive visual identity across the laboratory site.

Guideline: Use buildings to overcome the topography and provide ease of pedestrian flow and disabled access

- Where possible, design interior and exterior circulation to provide pathways from lower elevations to higher elevations, using elevators to overcome large differences that can't be accommodated by ramps.

Vehicular Access – Roads

Objective: Design all new streets to accommodate two-way vehicle traffic flow as well as pedestrian access

- Streets shall primarily be no greater than 24'-0".
- Curbs and sidewalks shall be provided where appropriate for pedestrian safety and erosion control.

Objective: Create service yards with sufficient room and in a manner that controls polluted runoff.

Service yards and access roads shall be of a width necessary to maneuver delivery trucks and emergency vehicles. Surfaces shall be asphalt with concrete pads as necessary to provide a durable truck staging area at loading docks. Surface drainage in these areas will be directed away from landscaped areas and into collection intakes to reduce seepage of contaminating oils and other chemicals.

Objective: Reduce the amount of impermeable surfaces at the Lab

- Permanent roadways will be surfaced with asphalt or other materials that will prevent seepage of contaminating oils and sediments. Roadways shall be constructed to support truck loads as specified in Lab road standards. Access roadways intended for limited access and emergency access only may be constructed with landscape pavers to increase permeable surfaces.

Vehicular Access – Parking Lots and Plazas

The intent of the Parking Design Guidelines to integrate parking into overall site appearance through measures that minimize visual impact, protect water quality, limit the negative effects of associated noise lights and utilize materials that result in the least environmental impact.

Objective: Minimize visual and environmental impacts of new parking lots

- New parking and improvements to existing lots shall be sited and designed to minimize their visual impacts to off-site locations, visitors and Laboratory staff.
- New parking lots shall be designed to follow the existing terrain and shall be terraced to minimize slope retention and cut and fill of the site.
- Drainage from the parking areas will be contained by natural materials that can be used as edge treatments to guide drainage to filtered outlets and control erosion at the pavement edge. Gutters and or wheel stops shall be used to keep cars out of swale and other surrounding areas.
- Parking areas shall be screened in a way appropriate to location of the parking lot on the site and the characteristics of the surrounding area. Native trees and shrubs within parking lots will be maintained and planted to provide shade and screen distant views to lots from both on and off-site locations. Native shrubs and small trees will be planted at the lot's perimeter to cause the parking and its screening to recede into the natural surroundings. Provide shade trees interspersed throughout to break up large parking areas.

Objective: Create parking plazas to accommodate multiple functions where restricted sites do not allow for them to be segregated

Parking plazas are a multi-use space capable of providing space for delivery, emergency access and reserved parking in conjunction with safe pedestrian access routes to building entries within constrained spaces.

- Reduce parking density within the plaza to allow free pedestrian movement and generous landscape plantings.
- Provide barriers such as raised planting beds, bollards, and ramped walkways to slow traffic and allow a protected zone for pedestrian movement.
- Provide plaza surfaces that resemble that of pedestrian-only spaces to reinforce the pedestrian use of the space and slow traffic.

Vehicular Access – Parking Structures

Objective: Site and design parking structures to integrate with the natural surroundings.

- Configure parking layouts to allow floor plate aspect ratios and massing that is fitted to the specific conditions of the site—long, narrow structures (1-2 aisles) on hillside sites and square structures (3-4 aisle) on level sites.
- Configure efficient parking layouts to reduce the area dedicated to circulation by allowing entry points from multiple levels of the site.
- Parking structures and associated site retention structures shall be constructed of cast-in-place and/or pre-cast concrete. Surface texture shall be compatible with adjacent architectural design themes. Finish color will be compatible with surrounding buildings and is intended to blend with the natural surroundings. Enclosed lobbies, and stairwells may be clad in glass.
- To the degree possible incorporate shade trees and plantings that the building's perimeter and top level exposed to view. Provide adequate tree coverage at the top level to shade cars, reduce glare, and minimize visual impacts. Continuous planting beds at each level may be incorporated into the structure's façade to further integrate the structure into the surrounding landscape.

Building Specific Guidelines

The intent of the Building Specific Guidelines is to establish a building design aesthetic at Berkeley Lab that is sympathetic to the Laboratory's hillside setting and the Guideline to build a UC quality campus experience through each new project. An overriding Guideline is to minimize the visual impact of buildings to the extent consistent with program needs while also providing flexible facilities that can accommodate expansion and alterations.

Building Organization

Objective: Create buildings that are flexible, modular, and expandable

- Each new building shall be configured to accommodate a broad range of functions in both the long and short term. In general a building width of between 60' and 80' can accommodate a variety of office, lab and support space layouts. Structural grids shall be based on dimensions compatible with industry standards for laboratory equipment and furniture and office modules to ensure future flexibility.
- Each new building shall have a floor-to-floor height of at least 15'-0" in order to accommodate a wide range of research functions and the infrastructure they require. A greater height on the ground floor may be provided to accommodate large public assembly spaces and or high-bay laboratory spaces.

Objective: Create buildings that encourage interaction among their inhabitants

- Circulation, both vertical and horizontal shall be designed to foster communication by being enjoyable places, provide access to daylight and views.
- Active public spaces such as lobbies, meeting and break rooms, display areas shall be located adjacent to outdoor spaces and pedestrian routes and pathways.

Objective: Organize service functions to minimize conflicts and visual impacts

- Service entries and associated equipment and activities shall be located to minimize visibility. All bulk trash containers, building and support equipment shall be concealed within enclosures designed as integral elements of the architecture. Loading docks shall be concealed and secured when not in use.

Architectural Expression

Objective: Insure each new building contributes to cohesive and coherent architectural expression through the Laboratory site

- Each building shall be a coherent architectural composition and shall employ a single unifying vocabulary of forms, details and materials on all building facades. Design themes for new building facades shall be designed to integrate new development into the natural and built context and to provide a cohesive Laboratory image. The architectural expression of each new building will promote the enduring architectural themes of each cluster that contributes to the cohesiveness of the overall visual fabric of the Laboratory.
- The design of building facades shall consider treatments that respond to the characteristics of each exposure with respect to heat, light, ventilation and view. Provide shading devices to reduce solar heat gain and glare particularly on the larger southern and western exposures directed toward distant bay views. Employ devices and design strategies to allow natural ventilation and air flow to the degree feasible. Use larger glazed exposures to the north and east for natural light.

APPENDIX C
LBNL Facilities Space

TABLE C-1
FACILITIES DEMOLISHED SINCE ISSUANCE OF 2003 NOTICE OF PREPARATION

Building #	Building Name	Type	Size (gsf)	Year Demolished or Removed
71H	Office	Trailer	1,424	2003
31L	Office	Trailer	290	2003
51N	Biomedical Treatment Facility	Building	645	2003
77C	Storage container	Container	020	2004
75T	Storage container	Container	160	2004
75U	Storage container	Container	160	2004
51B	EPB Hall	Highbay	43,911	2004
51L	Computer Training Facility	Trailer	864	2004
67E	Storage	Trailer	296	2004
29D	Office / Lab Building	Trailer	276	2005

SOURCE: LBNL, 2006

TABLE C-2
LBNL OFF-SITE LEASED SPACE, 2006

Building #	Facility Name	LBNL-used space (square feet)	Location
100/400	Joint Genome Institute (JGI)	56,800	Walnut Creek
500	JGI Warehouse	4,600	Walnut Creek
903	Warehouse, Receiving	122,000	City of Berkeley
913	Greehhouse	6,000	Richmond
937	Berkeley Tower	45,900	City of Berkeley
943	Oakland Scientific Facility	53,000	Oakland
962	Wash. DC L'Enfant Plaza	6,000	Washington, D.C.
965	Kitty Hawk	2,500	Livermore
977	Potter Street	54,000	City of Berkeley
	TOTAL	350,800	

SOURCE: LBNL, 2006

TABLE C-3
LBNL MAIN SITE FACILITIES

(THIS TABLE, WHICH FOLLOWS, IS A REPRINT OF LRDP APPENDIX A.)

Main Site Building Inventory 2006

Note: See Figure A.1 Building Inventory Key Map on Page 93 for building location

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
002	Advanced Materials Lab	B	D4	85,506
002A	Central Chemical Storage	B	D4	182
004	ALS Support Facility	B	D5	10,176
005	Laboratories and Research Offices	B	D5	7,176
006	ALS (Advanced Light Source)	B	D4	118,573
007	ALS Support Facility	B	D4	21,433
007A	Storage	B	D4	128
007C	Offices	T	D4	479
010	ALS Support Facility	B	D4	15,200
010A	Telecommunications Equipment	T	E4	242
013A	Environmental Monitoring Station	B	•	76
013B	Environmental Monitoring Station	B	A2	76
013C	Environmental Monitoring Station	B	•	76
013D	Environmental Monitoring Station	B	•	76
013E	Environmental Monitoring Station	B	C1	68
013F	Environmental Monitoring Station	B	•	36
013H	Environmental Monitoring Station	B	E4	90
014	Laboratory and Offices	B	D5	4,201
016	Laboratories and Research Offices	B	D5	11,808
016A	Storage	B	D5	339
017	Shop, Assembly, and Office	B	C4	2,222
025	ENG Shops	B	D5	20,304
025A	ENG Shops	B	D5	7,548
025B	Waste Treatment Unit Shelter	B	D5	360
026	Medical Services, Labs, and Offices	B	D5	10,562
027	Dry Lab and Offices (Special Instrument)	B	C4	3,299
028	Radio Shelter Facility	B	E5	544
029A	(vacant)	T	D3	1,751
029B	(vacant)	T	D4	1,440
029C	(vacant)	T	D4	1,440
029D	(vacant)	T	•	276
031	Chicken Creek Building	B	E6	7,327

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
031A	FA	T	E6	623
031B	Storage	T	E6	157
031C	Storage	T	E6	157
033A	Strawberry Canyon Guard House	B	E8	52
033B	Blackberry Canyon Guard House	B	D2	94
033C	Grizzly Peak Guard House	B	D6	80
034	ALS Chiller Building	B	E4	5,163
036	Grizzly Substation	B	D5	880
037	Utility Services Building	B	E4	5,833
040	Storage	B	D5	993
041	Communications Lab	B	D5	995
043	Site Air Compressor/FD Emerg Gen	B	E5	1,020
044	ENG	B	D5	805
044A	ALS Offices	T	D5	481
044B	ENG	T	D5	1,441
045	Fire Apparatus	B	E5	3,342
046	Laboratories, Shops, and Offices	B	C4	54,133
046A	Offices	B	C4	5,563
046B	ENG	T	C4	1,238
046C	AFR	T	C4	1,029
046D	AFR	T	C4	771
047	Offices	B	C4	6,242
048	Fire Station, Emerg. Command Ctr.	B	E5	6,622
048A	Storage Container	Cargo Container	E5	320
050	Laboratories, Shops, and Offices	B	C3	48,534
050A	Laboratories, Shops, and Offices	B	C2	66,628
050B	Laboratories, Shops, and Offices	B	C2	63,603
050C	Offices	B	C2	2,768
050D	Offices (limited use files storage)	B	C2	4,959
050E	Offices	B	C2	10,643
050F	Offices	B	C2	9,449
051	The Bevatron	B	C3	96,562

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
051A	Bevatron	B	C3	28,478
051F	ES, EET	T	B3	1,499
052	Dry Laboratory and Offices	B	D5	6,425
052A	Storage	B	•	516
053	Laboratories, Shops, and Offices	B	D4	6,944
053B	AFR	T	•	519
054	Cafeteria	B	D3	15,451
054A	Automated Teller	B	D3	195
055	Laboratories and Offices	B	B3	19,048
055A	Laboratories and Offices	B	B3	1,535
055B	Standby Generator Shelter	B	B3	209
056	Accelerator and Research Office	B	B3	1,782
058	Heavy Ion Fusion	B	D4	10,279
058A	Accelerator R&D Addition	B	D4	12,653
060	Hibay Lab	B	B3	3,615
061	Storage	B	E5	323
062	MS, CH Lab	B	F7	55,904
062A	EE, MS	T	F7	1,238
062B	Telephone Equip. Storage	B	F7	169
063	EE	B	B3	2,696
064	LS/ES	B	B3	29,358
064B	FAC	T	B3	480
065	Offices	B	C2	3,423
065A	Offices	T	C2	1,453
065B	Offices	T	C2	1,020
066	Ctr for Surface Sci. Catalysis	B	F7	44,134
067	Molecular Foundry	B	F7	90,712
067A	Molecular Foundry	B	E7	6,443
068	Upper Pump House	B	D6	500
069	Facilities Dept. Operations	B	D6	20,461
070	NS, EE LAB	B	D3	63,427
070A	NS, LS, CS, ES, ENG LAB	B	D3	68,430

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
070B	Telephone Equip. Storage	B	D2	382
070E	Storage Container	T	D2	432
070G	Storage	T	D3	173
071	Ion Beam Tech, Ctr Beam Phy	B	B4	53,744
071A	Low Beta Lab	B	B4	4,041
071B	Ctr Beam Phys	B	B4	6,892
071C	Offices	T	B4	511
071D	Offices	T	B4	520
071F	Offices	T	B4	516
071G	Offices	T	B4	517
071J	Offices	T	B4	1,289
071K	Offices	T	B4	474
071P	Offices	T	B4	511
071Q	Restroom Trailer	T	B4	357
071T	Offices	T	B4	949
072	Nat'l Ctr for Electron Microscopy	B	E7	5,352
072A	High Voltage Electron Microscopy	B	E7	2,532
072B	Atomic Resolution Microscope	B	E7	4,508
072C	NCEM	B	E7	8,409
073	ATM AEROSOL RSCH	B	F8	4,228
073A	Utility Equipment Building	B	F8	403
074	LS LABS	B	E9	45,382
074F	Dog Kennel	B	E9	1,560
075	EH&S Radiological Services	B	D6	8,498
075A	EH&S	B	C6	4,000
075B	EH&S	T	D6	4,640
075C	Calibration Building	B	D6	450
075D	Storage	B	D6	1,895
075E	EH&S Offices	T	D6	410
076	FAC Shops	B	D6	31,642
076K	FA Offices	T	D5	371
076L	FA Offices	T	D5	1,439

BLDG. ID	NAME	(B)UILDING (T)RAILER	MAP GRID REF	SIZE (GSF)
077	ENG Shops	B	D6	68,438
077A	Composites Lab and Assembly Facility	B	D7	12,118
077H	Utility Storage	B	D7	576
078	Craft Stores	B	D6	5,391
079	Metal Stores	B	D6	4,564
080	ALS Support Facility	B	D4	29,930
080A	ALS Support Facility	B	D4	960
081	Chemical Storage	B	B4	1,129
082	Lower Pump House	B	B4	537
083	LS LAB	B	E9	6,856
083A	LS Lab Trailer	T	E9	507
084	LS Human Genome Lab	B	E9	55,031
084B	Utility Building	B	E9	1,633
085	Hazardous Waste Handling Facility	B	E8	15,405
085A	Storage Racks	B	D8	885
085B	Offices	T	E8	3,601
088	88 Cyclotron	B	C2	54,428
088D	Emergency Generator Building	B	•	265
090	DOE, EE, EHS, ES Offices	B	B2	87,837
090B	Offices	T	A2	1,443
090C	Ops Offices	T	B2	1,143
090F	FA Offices	T	A2	2,464
090G	HR Offices	T	A2	1,851
090H	FA Offices	T	B2	1,849
090J	FA Offices	T	B2	2,845
090K	EETD Offices	T	B2	2,846
090P	Ops Offices	T	B2	2,133
090Q	Restroom Trailer	T	B2	425
090R	Transformer Equipment	T	•	160

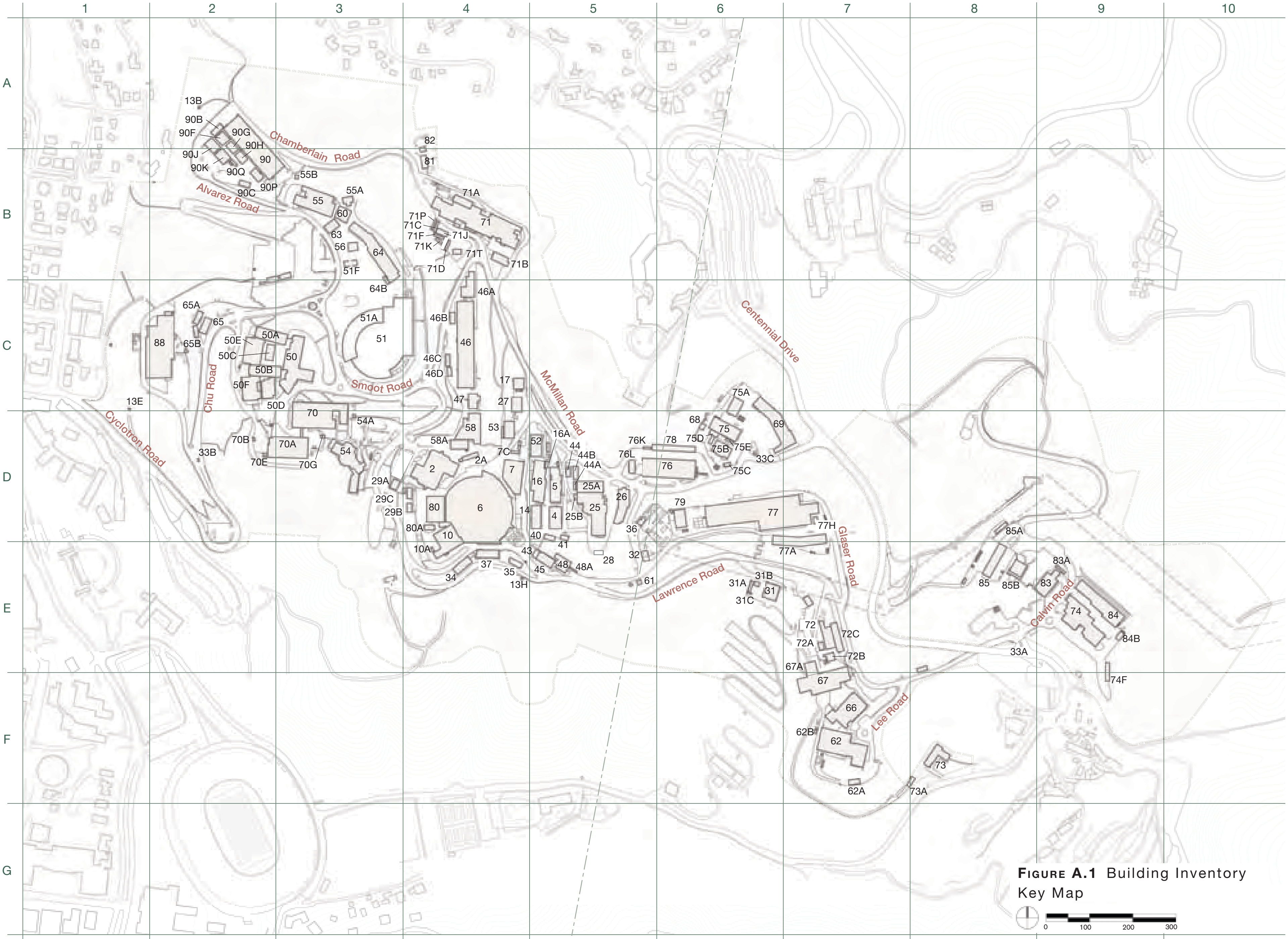

Figure A.1 Building Inventory Key Map

APPENDIX D
Individual Future Projects

Individual Future Projects

User Guest House

As a major element of its mission, Berkeley Lab has built and operates one-of-a-kind scientific facilities for use by academic and other researchers from around the world. The majority of users visiting these facilities are from outside the Bay Area and must obtain short-term housing. Faced with a shortage of convenient, affordable housing near Berkeley Lab, the user communities have requested that on-site, low-cost, short-term housing be made available.

The Laboratory is responding to the lack of on-site housing for its guests by proposing the Berkeley Lab Guest House project. The Guest House would provide customer-centered, low cost and accessible services; a safe, clean, smoke-free and technology-enhanced environment; an effective visitor transition into LBNL; a visitor and user- oriented service experience; and 24-hour convenient access to research-support amenities and science facilities.

The proposed project site is a one-acre University-owned parcel with a filtered San Francisco Bay view and frontage on Lawrence Road in the interior "Laboratory Commons" area of Berkeley Lab. The site is directly across from the Cafeteria, adjacent to Building 2, and near to the Advanced Light Source, a Berkeley Lab landmark. Three unusable modular buildings and three-stack parking spaces currently occupy the site. The sloped terrain drops approximately 40 feet from east to west and is populated by oak, pine, and eucalyptus trees.

The building would be designed in accordance with the LBNL's design guidelines and would respect the scale, rhythm, and patterns of the surrounding architectural context through massing, exterior finishes, and other architectural elements. Exterior materials would be chosen to be compatible with the surrounding neighborhood. Common-use areas in the project include a main lobby, lounge areas, a fitness center, laundry, vending areas, and outdoor patio.

The Guest House would be a three- story single building of Type V construction (wood frame)18,400 ASF and 70 beds. The 18,400 assignable square-foot (ASF) building would have a double loaded corridor, one elevator and exit stairwells at the each end.

The Guest House would provide 70 beds for short-term visitors at the Berkeley Lab in single- and double-occupancy rooms for a total of 12,900 ASF in living quarters. The 44 standard-size rooms would be approximately 190 gross square feet (gsf) and would each include a full-size bed. Twelve larger size rooms would be approximately 250 gsf and include either one queen-size or two full-size beds. Four studio suites would be approximately 350 gsf and include a kitchenette plus either a queen-size bed or two full-size beds. Four of the studio size rooms would be handicapped-accessible, built to meet the requirements of the Americans with Disabilities Act.

The building would be sited to maximize the site by positioning the structure to align with the natural topography, respond to new and existing pedestrian paths, and position guest rooms to view San Francisco Bay. All of the units would have exterior windows to provide natural light. The main entry would have access from Lawrence Road, with additional entries to common areas. Each point of entry would reinforce the pedestrian corridors that would link the facility to the adjacent buildings and parking lots. The building would be set back from Lawrence Road to provide a driveway and drop-off/pickup point at the front entrance.

Parking spaces would be provided for disabled Guests; and additional, limited-time spaces would be provided for use by delivery vehicles, taxis, and by Guests during check-in/out. Otherwise, no new parking is planned to be included in the project. Staff parking would be provided in the existing parking lots. It is anticipated that less parking would be required by Guests overall as a result of this project, as they would be more inclined to take public transportation or a taxi to/from the Guest House and not rent a car for daily use between regional accommodations and Berkeley Lab.

The Guest House would meet or exceed the Presidential Policy for Green Building Design and Clean Energy Standards. The 1987 LRDP, which governs this project, includes guidelines to achieve specific facilities planning requirements while respecting site constraints and providing coherence among building elements and the landscape. The LRDP addresses issues such as building scale, the relationships to surrounding buildings, the interface with the streetscape and sidewalks, pedestrian circulation, parking, open space and outlooks, landscaping and plantings, exterior material & design compatibility, energy efficiency, and environmental sustainability. These guidelines would be included in the design criteria within the contract awarded to the project architect at the beginning of the Design/Build Request for Proposal.

Construction of the project would begin in December 2007 and would be completed in March 2009. Construction considerations would include:

- Sloping Terrain. The sloping site would require extensive site work to form a flat construction site, retain the hillside, and protect the environment during construction. Proximity to associated facilities, the routing of roads and utilities, parking areas, facility entry/exit points, and pedestrian circulation paths are all made more difficult by the varying terrain around the designated site.
- Parking and staging limitations. The site includes a relatively constrained adjacent laydown area and would require remote parking with a shuttle service for the construction work force.
- Near-fault condition. Because the project site is within a few hundred yards of the Hayward Fault, a more robust structure and complex building techniques are required to meet the stringent seismic safety requirements.

Helios Research Facility

The proposed project site is a two-acre University-owned parcel adjacent to the Materials Sciences Research Cluster area of Berkeley Lab. The site is at the Hill Area east of the main hill site, on southern side of the Berkeley Laboratory; with a view of San Francisco Bay, flanked by LBNL Buildings 62, 66, 67, and 72 to the east. The sloped terrain of the proposed building site drops approximately 80 feet from east to west and is populated by a small number of pine and immature redwood trees. The proposed primary access road would be an improvement to the existing UC Berkeley corporation yard road that connects to Centennial Drive and winds through laurel, eucalyptus, and oak trees.

The UC Berkeley main campus chemistry, physics and biotechnology and bioengineering research facilities at the eastern side of campus would be readily accessible by a short shuttle bus trip or a walk through Strawberry Canyon. A key benefit of this building site is its adjacency to three Berkeley Lab national user facilities - the Advanced Light Source, the Molecular Foundry, and the National Center for Electron Microscopy. In addition, the Joint Genome Institute is 18 miles east. These facilities will be available for, and vital to, the success of the Helios research program.

The building would align with the site's natural topography, respond to new and existing pedestrian paths, and be oriented towards the view of San Francisco Bay. The main entry would have open access from Centennial Drive, with additional entries to common areas and for maintenance access. In addition, a controlled-access entry would be provided from Berkeley Lab. Each point of entry would reinforce the pedestrian corridors that would link the facility to the adjacent buildings and parking lots.

Up to ten parking spaces adjacent to the building would be included with the project and reserved for disabled drivers, vanpools, and limited-time use by delivery and maintenance vehicles. The corporation yard would be relocated to make room for a parking area; a fifty-space surface parking lot, readily accessible by building occupants, may be provided under a separate project.

The Helios Research Facility would be a lab/office. The new building would be approximately 90,000 gross square feet and 3 to 5 stories tall. It would feature flexible, cross-disciplinary space assignments so as to foster interaction and collaboration between diverse scientific and engineering communities. The scientific disciplines would be approximately two-thirds Bioengineering and one-third Nanostructured Materials. Functionally, the space would be approximately one-third wet laboratory space, one-third dry laboratory and research support space, and one-third office/conference space including a 250-person auditorium.

Specialty requirements for biological engineering include greenhouse facilities, cool rooms, molecular and microbial biology labs, fermentation labs, a high-throughput screening facility, and analytical facilities. Space needs specific to nanostructured materials include low vibration / electrical noise areas for scanning probe microscopes and custom-built electron microscopes. Other space needs include a low-level clean room space (class 10,000), and catalysis, electrochemistry, chemical separations, and computational research laboratories.

The Facility would be designed to be consistent with the 2006 LRDP and design guidelines with respect to the scale, massing, exterior finishes, and other architectural elements. Exterior materials would be chosen to be compatible with the surrounding buildings and the natural setting.

The Helios Research Facility would exceed the Presidential Policy for Green Building Design and Clean Energy Standards to demonstrate the principles of the research endeavor through environmental stewardship and resource conservation. The facility would be designed and constructed to feature innovative solar energy use, meet the U.S. Green Building Council's LEED[1] Gold level for sustainability; and to outperform the required provisions of the California Energy Code by at least 40 percent.

[1] LEED: Leadership in Energy and Environmental Design

CRT Building

The proposed project site is a 2.25-acre University-owned parcel in the Blackberry Gate area of Berkeley Lab. The site is at the west end of the Laboratory, and features a filtered San Francisco Bay view and frontage on Seaborg Road, flanked on three sides by Buildings 70 and 70A to the east, the Building 50 complex to the north, and the Blackberry Gate to the west. The sloped terrain drops approximately 100 feet from east to west and is populated primarily by eucalyptus trees among a small number of immature oak and redwood trees.

The site is within walking distance or a short shuttle bus trip to the UC Berkeley Physical and Computer Science Departments. Pedestrian spines would be established to Cyclotron Road and already exist to the Building 50 complex, and to Buildings 70 and 70A. The building would maximize the site's potential by positioning the structure to align with the natural topography, respond to new and existing pedestrian paths, and align offices to view San Francisco Bay. Offices would have exterior windows to provide natural light to the extent feasible. The main entry would have access from Seaborg Road, with additional entries to common areas. Each point of entry would reinforce the pedestrian corridors that would link the facility to the adjacent buildings, shuttle bus routes, and parking lots. The building would be set back from Chu Road to maintain a sense of openness at the main entrance to the Laboratory.

Parking spaces would be provided for disabled Guests. Additional, limited-time parking spaces would be provided for use by delivery and maintenance vehicles. No additional new parking spaces would be included in the project. Staff parking would be provided in the existing parking lots. The site is within 500 feet of both the Horseshoe Parking Lot F to the south and Blackberry Canyon Parking Lot D to the north.

The pre-conceptual building plan includes 32,000 gross square feet (gsf) of computing space and 80,000 gsf of office**,** visualization lab, and conference space. This computer floor size is two-thirds larger than the floor space at LBNL’s leased computer floor in Oakland in order to accommodate two high-performance computing systems at one time and anticipated growth in the scientific cluster support area. The office space would accommodate approximately 75 UC Berkeley staff and students, and 225 Berkeley Lab staff. The facility would also include 35,000 gsf of electrical/mechanical space to serve the computer electrical load and provide the cooling required. The facility would have a floor footprint of approximately 35,000 gsf, smaller footprints for the upper floors, and it would be 6 or 7 stories tall.

While a new electrical feeder would be installed from the Grizzly Peak Substation, all other major utilities are available in the immediate area. A geologic fault investigation performed in September 2006 in conformance with the Alquist-Priolo Act revealed no traces of an active fault on the proposed project site.

The CRT Facility will meet or exceed the Presidential Policy for Green Building Design and Clean Energy Standards. The building site and size of the facility are consistent with the 2006 LBNL LRDP. The building would be designed in accordance with the LRDP Design Guidelines and respect the scale, rhythm, and patterns of the surrounding architectural context through massing, exterior finishes, and other architectural elements. Exterior materials would be chosen to be compatible with the surrounding neighborhood.

APPENDIX E
Description of Existing Buildings 71 and 88

Condition of Existing Buildings at LBNL

Figure E-1 depicts conditions of existing buildings at the Berkeley Lab's main site in the Oakland-Berkeley hills. The following provides background information regarding two existing, potentially historic buildings.

Building 71 - Hilac/SuperHilac/Bevalac

Function

Building 71 was designed by the San Francisco architectural firm of Corlett and Spackman and constructed in 1957 to facilitate nuclear science studies. The building initially housed the Heavy Ion Linear Accelerator, or Hilac, which was one of the world's first accelerators built specifically for heavy-ion research. The basic elements of the Hilac were a Cockcroft-Walton generator and two Alvarez-type linear accelerators. Between 1958 and 1970, a team of Hilac scientists headed by Glen Seaborg and Albert Ghiorso was responsible for the discovery and synthesis of the elements 102-Nobelium, 103-Lawrencium, 104-Rutherfordium, and 105-Hahnium. (Element 106-Seaborgium was produced by the SuperHilac in 1974.)

The equipment and infrastructure in the Hilac were modified and upgraded in 1961, 1965, and 1969. The Hilac was converted to the SuperHilac in 1971-72, which enabled the machine to accelerate beams of all ions at higher speeds.

In 1974, the SuperHilac was connected to the Bevatron. The result was the hybrid facility known as the Bevalac, which combined the best features of both machines: the heavy ion capability of the SuperHilac and the high-energy capability of the Bevatron. Capable of accelerating even the heaviest of nuclei, the Bevalac was used to study how nuclei matter behaved under extreme conditions and how it changed from one physical state to another.

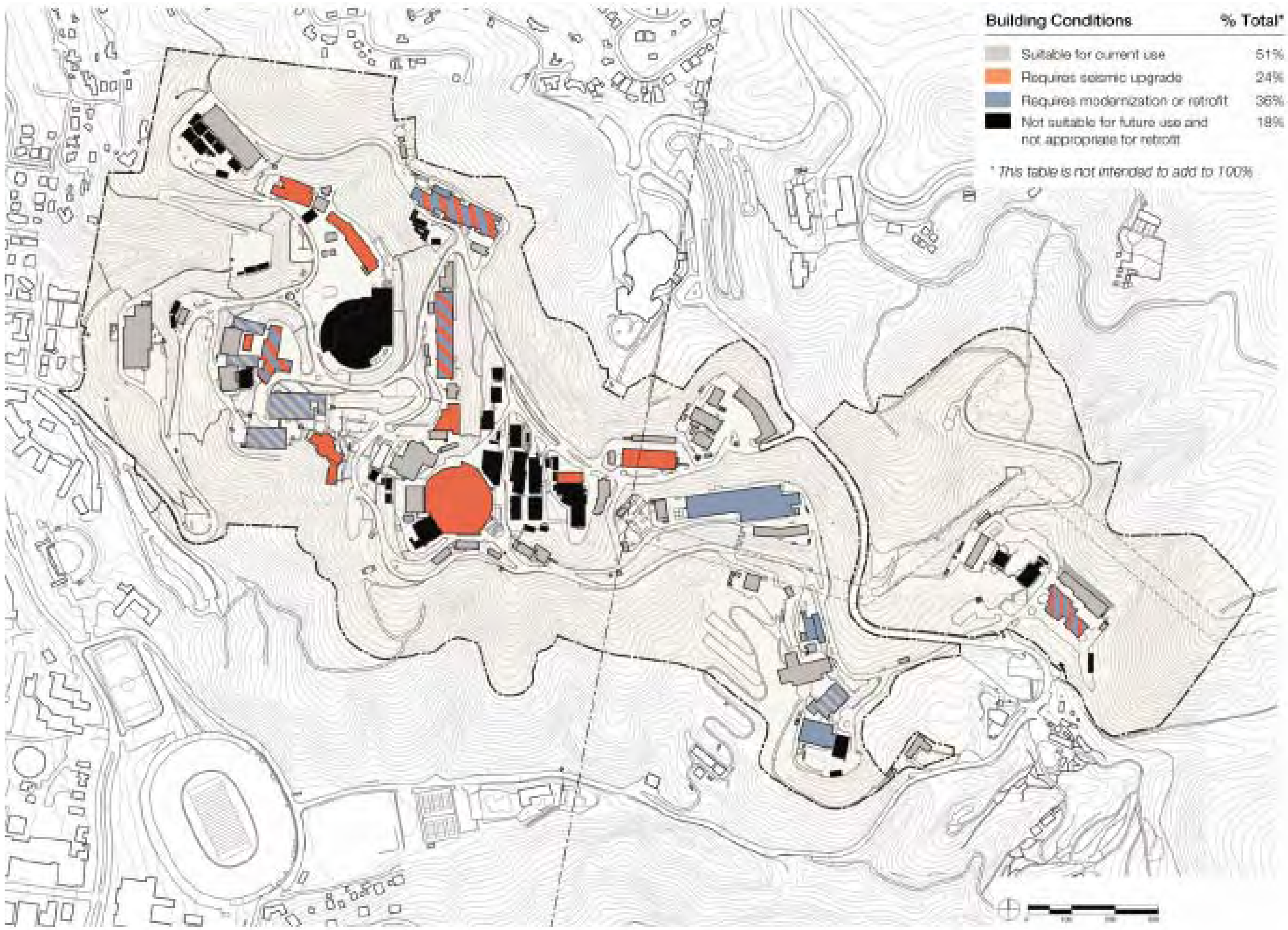

Figure E-1
Conditions of Existing Buildings at LBNL Main Hill Site

The Bevalac was used for medical research, cosmic ray experiments, and radiation therapy for the treatment of cancer. After an upgrade in 1981, the Bevalac became the only accelerator in the world capable of accelerating to near light-speed all of the naturally occurring elements of the periodic table, including ions as heavy as uranium.

The Bevalac offered researchers high intensity beams of carbon, oxygen, neon, and argon, which were produced and accelerated in the SuperHilac and transferred down the beam line to the Bevatron for further acceleration. The Bevalac had up to 500 user association members who represented nuclear science, cosmic ray research, and biological and medical interests from all over the world.

Physical Description

Exterior

Building 71 is a modified rectangular structure with an east-west orientation that was built in several phases or increments into the hillside. The downhill side of Building 71 is a two-story structure, while the uphill side is generally a one-story structure. Building 71 was originally shaped as two parallel rectangles with unequal height and dimensions. Today, the main building covers approximately 57,000 square feet in area. (The larger downhill rectangle measures 191 feet by 29 feet by 38 feet high.) The elements of the SuperHilac were added on all sides giving the structure an irregular shape. The building reflects an industrial vernacular -- international style with linear, symmetrical features and minimal façade ornamentation. The building features steel-frame construction; a flat roof; solid exterior walls of precast concrete, fluted metal, and steel panel cladding occasionally broken up by a horizontal band of windows; and a monochrome painted exterior.

Interior

The main Building 71 high bay housed two injectors, a linear accelerator, and a switchyard. A third injector was housed in a smaller high bay adjacent to the main building. The main high bay also included the terminus of the 550-foot beam transfer line that consisted of four-to-six-inch diameter pipe that linked the SuperHilac to the Bevatron. Offices, laboratories, shops, and mechanized support services were and continue to be located in the rear of Building 71. Today, the pre-stripper and post-stripper tanks, several pieces of supporting infrastructure, and switchyard magnets are what remain of the Hilac, SuperHilac and the Bevalac. The three injectors, portions of the linear accelerator, and the beam transfer line to the Bevatron have been removed. Most of the caves have also been extensively modified and/or removed.

In 1998, the American Chemical Society nominated Building 71 as a National Historic Chemical Landmark. Buildings 71 received National Historic Chemical Landmark status, due to the discoveries of eleven transuranium elements that were made in these buildings between 1949 and 1999.

Building 88

Function

Built between 1958-1962, Building 88 houses the 88-inch cyclotron and has been used for heavy ion research. The cyclotron was developed by a team of scientists and engineers at the Berkeley Laboratory under the direction of physicist Dr. E. L. Kelly (Lawrence Radiation Laboratory n. d.).

The Laboratory's Nuclear Science Division operates Building 88 and the 88-inch cyclotron in support of DOE programs in basic nuclear science. The cyclotron was originally built as a general-purpose accelerator for the nuclear chemistry program to accelerate heavy ion beams from the center region to the its radius, where high voltages were used to deflect the beam out of the cyclotron.

The 88-inch cyclotron, which accelerates protons and alpha particles to variable energies up to 100 MeV (Million electron-volts), is one of the new generations of cyclotrons that were built after 1960. These third-generation accelerators incorporate the high beam intensities of first-generation, conven¬tional cyclotrons with the high energies of second-generation synchrocyclotrons. The capability of accelerating various particles to any required energy, which was pioneered on several of the older cyclotrons, is present in many of the new accelerators, such as the 88-inch cyclotron (Lawrence Radiation Laboratory n.d.).

The 88-inch cyclotron is a versatile accelerator in support of DOE programs in nuclear science and research in areas of nuclear reactions, nuclear astrophysics, and chemistry. The accelerator's flexible design regularly produces a variety of species of beams. The more electrons that are "stripped" during the process of acceleration, the higher the possible energy of accelerated ions. During the acceleration, large electromagnets are used to steer the focus of the beam to the experiments. Sophisticated vacuum systems protect the beams from losing energy during the process.

Recently the cyclotron was enhanced with the addition of an Advanced Electron Cyclotron Resonance (AECR) ion source, located on top of the vault, which enables the accelerator to boost its beams to higher energies than previously obtainable.

Physical Description

Exterior

Building 88 was designed by San Francisco architects Gerald McCue and Associates. Constructed in 1960-62, Building 88 is representative of the International Modernist architectural style with its sharp, distinctive building lines, structural steel frame, steel girders and columns, flat (insulated) metal deck roof, vertical metal cladding, symmetrically placed industrial windows, and minimal surface ornamentation. The most notable feature is the high bay that houses the vault, cyclotron, and caves. The building covers approximately 50,700 square feet. Over the years, additions were constructed to provide extra space for scientists and other personnel conducting experiments. All of the additions matched existing construction features and materials.

Interior

The Building 88 interior is a high bay housing the cyclotron, vault, caves, ion sources, laboratories, shops, counting rooms, a control room, and offices that support the 88-inch cyclotron operations. A 30-ton ceiling crane in the upper reaches of the high bay maneuvers large, moveable concrete blocks around the cyclotron to provide protective shielding during experiments. Other interior features include concrete floors; an exposed, metal ceiling in the high bay; acoustic tile ceilings in the offices; steel beams that provide structural support; insulated metal panel walls; gypsum board partitions; and roll-up, corrugated metal, garage style doors.

Conclusion

Following investigation by a qualified historian and discussions with the State Historic Preservation Office, Building 71 and 88 may be recommended as eligible for inclusion in the National Register. While both properties have not retained all the historic physical features that contributed to their significance (i.e., laboratory equipment, machinery), they may have retained enough characteristics that enable them to convey their National Register significance.

It is likely that the significance of both of these buildings lies more in their technological features than in the buildings themselves. Thus, any changes to the exterior of these buildings, as well as changes to the interior that do not modify and/or remove remaining historic scientific and technological equipment or parts, might not adversely affect the integrity of those features that contribute to the significance of these buildings.

APPENDIX F

LBNL Draft Transportation Demand Management Program

Final Draft, December 7, 2006

Overview and Current Conditions

The purpose of the LBNL Transportation Demand Management (TDM) Program is to reduce total vehicle trips to and within Berkeley Lab, reducing emissions as well as traffic impacts and parking demands. The strategy is to implement TDM programs that increase awareness among staff and offer incentives to access the Laboratory by means other than the use of single-occupant vehicles, including public transit, carpools and vanpools, bicycling, and walking. Besides reduced traffic, emissions, and parking demands, other benefits include improved air and environmental quality, and improved relations between the Laboratory and the City of Berkeley and UC Berkeley due to reduced impacts.

Berkeley Lab's TDM Program facilitates a range of commute options for its employees that have served to reduce commuter vehicle trips to the Lab. As of the most recent Berkeley Lab transportation study, it is estimated that approximately 52% of Laboratory staff and visitors use their personal vehicles to commute to the Laboratory (see table) – a rate of use of alternative transportation modes comparable to institutions in dense urban areas. Further practices can be put in place, all of which will require increased resources, either directly in the form of expenses or indirectly due to staffing needs for implementation. The Lab is projected to experience moderate growth over the next twenty years, the impacts of which will be partially offset by the implementation of additional TDM practices.

Berkeley Lab limits the supply of parking available to employees, currently providing spaces for approximately 50% of its Adjusted Daily Population (ADP), reflecting the high degree to which access is achieved by means other than single-occupant vehicles. There are currently 2,300 parking spaces at the Laboratory, distributed as shown in Table 2.

Currently there are 1,932 general use parking spaces available (including spaces for the disabled) to serve an approximate ADP of 4,515. Parking at the Laboratory is free, but is allowed by permit only. Parking permits are provided to career employees and participating guests. The Laboratory has typically provided one free employee parking space for each 1.7 to 2.0 staff person and user/guest that is authorized to park an automobile on the Laboratory's main hill-site during the work day. Parking spaces are provided in an array of moderate to small surface parking lots dispersed throughout the Laboratory, and along the sides of many roads. There are currently no parking structures on the main site.

Table 1: Current Mode split estimates based on FY2000 employee transportation survey:

Mode	% of total	Number
Drive Alone	51.8%	2266
carpool >2x week	7.7%	336
motorcycle	2.7%	119
LBNL Shuttle	9.7%	426
LBNL Shuttle & bike	3.8%	168
Bicycle only	5.7%	248
Walk	4.3%	190
Current Transit	10.7%	469
Telecommute 2+x week	3.6%	156
Total	**100.0%**	**4376**

Table 2: Current Parking Mix

Parking Type	No. Spaces	No. Permits
Orange (employee)	32	26
Blue (employee)	309	792
General (employee)	1,552	2,523
Disabled	39	0
Emergency	3	0
Gov. Vehicle	271	0
Loading Zone	43	0
Motorcycle	23	101
Timed	11	0
Visitor	17	0
Total	**2,300**	**3,442**

Berkeley Lab has experienced an increase in demand of 25 to 30 parking spaces a year for the last fifteen years from staff population growth and an increasing demand on user facilities. This trend is expected to continue for the foreseeable future. Historically the lab has been able to meet this demand through providing an increased number of parking spaces, by creating stack parking, re-striping existing spaces for compact cars, and building additional surface parking lots. The Laboratory has added approximately 650 spaces over the past 16 years. The 1987 LRDP allowed for a total of 2410 spaces, a number which has not yet been reached.

The 2006 LRDP includes the projection of 500 net new parking spaces being added to the Laboratory over the next 20 years, accompanying a net Adjusted Daily Population increase of 1,010, meaning that the ratio of parking to population will be reduced. The draft EIR analysis of the 2006 LRDP indicates that key intersections in the City of Berkeley will be significantly impacted when the number of parking spaces at the Laboratory is increased beyond 375. It is hoped, therefore, that through the implementation of further TDM measures over the course of the LRDP time frame, the demand for parking will be reduced such that the number of new parking spaces added to the Lab will remain below the 375 figure.

Current TDM Measures

Berkeley Lab's current TDM program includes the following measures:

Laboratory Shuttle Service
The TDM component that has the greatest impact on Lab traffic is the Berkeley Lab Shuttle system. A system of small buses, the shuttle is offered free to Berkeley Lab employees and visitors. The shuttle has an on-site route that serves passengers within the Laboratory campus, and a number of external routes that connect the Laboratory to various locations within the City of Berkeley, including UC Berkeley, major AC Transit stops and BART stations. Stops are served generally every ten to fifteen minutes during normal working hours, Monday through Friday. The shuttle buses include racks for bicycles, so bicyclists can ride the shuttle up the hill and bicycle down. The shuttle reduces vehicle trips within the Laboratory, and provides access to the Laboratory for commuters using public transit such as BART.

Guaranteed Ride Home
The Lab provides a guaranteed ride home via Lab Security or taxi in case of family illness, family crisis, unscheduled overtime, or other emergencies. This encourages Lab employees to use alternative means of transportation getting to the Lab, as they can feel comfortable that in unusual or emergency situations they will be able to get home quickly. The Lab also participates in the Alameda County Guaranteed Ride Home program.

Pretax Transportation Program Incentive
Berkeley Lab offers employees participation in the "WageWorks" program, which enables Lab employees to deduct transportation costs of up to $100 with pretax dollars. This incentive offers commuter participants a discount of up to 40% for public transportation expenses such as BART or AC Transit tickets.

Carpooling/Vanpooling
The Lab's website links employees to Rideshare, a free regional ridesharing agency. Lab employees who participate in Rideshare can also deduct voucher expenses with pre-tax dollars as part of the Pretax Transportation Program.

Telecommuting and Flex Time
The Laboratory supports telecommuting, reducing the number of daily trips to the Lab by employees. The Laboratory also allows for flexibility in work hours to reduce peak demand.

Limited Parking
Parking is limited and difficult at the Laboratory, and is regulated through the use of parking permits. This discourages personal vehicle use.

Clean-fuel Vehicles
The Laboratory has an ethanol fueling facility and uses bio-diesel in some fleet vehicles.

Other related practices and benefits

Pedestrian Network
Berkeley Laboratory has a well developed internal system of pedestrian routes, encouraging pedestrian activity in lieu of the use of vehicles. This pedestrian network is connected to the UC Berkeley campus, the City of Berkeley, and surrounding neighborhoods, thorough a series of secure pedestrian gates. The network is lighted for security and to encourage use.

Government-owned Vehicles
The Laboratory owns and maintains a number of vehicles for Berkeley Lab business use. Employees who come to work without a personal car have access to a vehicle for short trips.

Bicycle infrastructure
Bicycling is a popular form of non-auto commuting to the Laboratory. Berkeley Lab has a well-developed infrastructure to support those who bicycle to work; specifically;

- Major Laboratory circulation routes include bike lanes.
- The Berkeley Lab shuttle accommodates bike transport.
- Bike racks are provided throughout the Laboratory.
- Showers are provided at a number of locations around the Laboratory.
- The LBNL Bicycle Coalition, a volunteer group at the Laboratory, are an organized bicycling group that encourage bicycle commuting through education and helping to improve facilities.

On-site amenities
Berkeley Lab provides many support services and amenities on-site, which reduces the number of stops during commutes and trips of people leaving the Laboratory to perform errands, including:

- ATM
- Cafeteria
- Guest housing (under development)
- Dental
- Employee activities, including recreation programs and facilities

Information and Marketing
Berkeley Lab provides information to employees about TDM programs and services through the following venues:

- Laboratory Newspaper “the View,” and e-news “Today at Berkeley Lab”
- Comprehensive pedestrian and bicycling maps
- Bulletin board displays
- E-mail bulletins
- Transit and access information in new employee orientation and Laboratory visitor packets
- Transportation fair
- Promotional events
- Employee advisory committee
- Spare the Air Campaign notifications

Phased Implementation of Expanded TDM Measures

Through a series of internal planning meetings as well as community meetings, a number of possible new TDM measures have been identified. Many require additional study to determine the cost and the TDM benefit before they can be implemented.

This Transportation Demand Management Program will be implemented in up to three phases, corresponding to the number of parking spaces to be added to the Laboratory as follows:

- **Phase 1:** increase from 2,300 to 2,410 spaces – maximum allowed under the current LRDP without additional environmental impact review
- **Phase 2:** increase from 2,410 to 2,675 spaces – maximum before local intersections are significantly impacted
- **Phase 3:** increase from 2,675 to 2,800 – maximum under the draft 2006 LRDP

It is hoped that the implementation of phases 1 and 2 will obviate the need for phase 3.

Implementation Phase 1:

increase from 2,300 to 2,410 spaces
(expansion of parking up to the level allowed in the 1987 LRDP)

The Laboratory may add up to 110 parking spaces under the current LRDP. Before this threshold is crossed, the Lab will undertake a number of the most basic TDM measures, as follows:

TDM Coordinator
Create a position of "TDM Coordinator" or "TDM Manager" who will monitor, plan, and implement TDM measures in coordination with parking and access. This person will oversee studies evaluating the cost and benefits of further TDM measures.

LBNL Transportation Committee
Form a committee to develop and implement TDM measures in conjunction with the TDM Coordinator position.

TDM, Traffic, and Parking Studies and Monitoring
Conduct an annual inventory of on-site parking spaces and track the number of net new spaces. Perform an annual gate count and commuter survey to more accurately profile the transportation modes used by Berkeley Lab commuters. Study service vehicle traffic to determine number of trips and vehicle modes of service and delivery vehicles. In conjunction with the City of Berkeley, monitor key intersections for traffic and pedestrian activity to assess impacts during Laboratory growth.

Additional Mass Transit Outreach
Investigate other forms of mass transit not currently being taken advantage of such as the SF Bay ferries and CalTrain.

TDM vs. Structured Parking Studies
Fund studies that compare the costs of more aggressive TDM measures vs. the cost of building parking structures – it may be cheaper to fund the TDM measures than to build parking structures.

Enhanced Information Campaign
Enhance informational campaigns to aggressively promote the use of alternatives to the single-occupant commuter vehicle with quarterly e-news and employee newspaper articles describing efficient alternatives and their outcomes of reduced traffic and preserved air quality benefits

Contractor Delivery Hours
Develop standardized contract specification information required in procurement / purchasing contracts to discourage or prohibit deliveries during commute hours, when these contracts involve delivery of goods to the Lab's site.

Bicycle Infrastructure
Expand bicycle racks at buildings and on Berkeley Lab shuttle buses if needed to meet the increased number of bicycle commuters.

Implementation Phase 2

Increase from 2,410 to 2,675 spaces
(expansion of parking up to significant impact level)

It is estimated that if more than 375 parking spaces beyond the current baseline of 2,300 are added to Berkeley Lab, key intersections in the City of Berkeley will be studied for increased traffic. Before this threshold is crossed, the Laboratory will continue to implement additional TDM measures that are determined to have sufficient benefit vs. cost. Those measures may include some combination of the following;

Parking Fee
Currently there is no fee for parking at the Laboratory, although permits are limited. Investigate charging a fee for parking to help discourage personal vehicle use and to pay for other TDM measures.

Shuttle Coordination Plan
Develop a coordinated shuttle plan in cooperation with UC Berkeley, Alta Bates Hospital, and the West Berkeley Transportation Management Agency/Bayer Corporation, all of whom operate shuttles, to see how coordinated shuttle scheduling could reduce overall impact for all.

UC Berkeley Shared Services
Investigate sharing additional services with UC Berkeley including the shuttles and parking to help reduce the overall impact.

Car Share
Investigate the use of Car Share service in addition to, or in lieu of, government-owned fleet vehicles, either outsourced or managed in-house, possibly using an on-line reservation system. Would provide reservable on-site automobiles for errands near LBNL.

Discount Group Pass Program
Sponsor an mass-transit deep discount group pass that would allow unlimited usage of regional mass transit systems, including both AC Transit and BART; modeled on the UC Berkeley BearPass (offered to UCB staff and faculty), the UC Berkeley ClassPass (offered to UCB students) or the City of Berkeley's EcoPass program (offered free to all City employees).

Enhanced Pretax Transportation Program
Enhance the "WageWorks" program already in effect with additional promotion and marketing as well as some subsidy by the Laboratory to further encourage use.

Enhanced Carpool/Vanpool
Create a more coordinated formal program for carpooling and vanpooling and offer incentives.

Alternative Fuels Program
Implement the use of alternative fuels such as biodiesel in the shuttle fleet and in government-owned Laboratory vehicles. Encourage and reward the use of alternative fuel vehicles in carpools and vanpools. Mandate the use of alternative fuel vehicles in contractor and construction vehicles.

Remote Parking
Create or Lease remote parking locations that could be serviced by the Berkeley Lab Shuttle in order to reduce on-site traffic and parking as well as traffic impacts in surrounding communities.

Preferential Parking
Dedicate preferential parking spaces to carpools and vanpools, encouraging their use.

Additional On-Site Amenities
Develop and provide additional support services and amenities on-site, to further reduce the number of stops during commutes and trips of people leaving the Laboratory to perform errands, such as:

- Child care
- Dry cleaning pick-up
- Gym

Implementation Phase 3

Increase from 2,675 to 2,800 spaces
(expansion of parking up to level allowed by 2006 LRDP)

If it is necessary to add more than 375 spaces to the Berkeley Lab main site within the time frame of the 2006 LRDP, key intersections within the City of Berkeley will be studied and if necessary, the Laboratory will consider additional options to ease traffic impacts. The following measures will be considered:

BART Bicycle Storage
Investigate the provision of additional bicycle storage lockers at BART stations that may be impacted by Berkeley Lab commuter traffic.

Critical Intersection Shared Funding

Investigate shared funding and prepare a plan for improving critical off-site intersections with funding shared among the Lab, other major institutions, and local jurisdictions (e.g. City of Berkeley, UC Berkeley, and LBNL).

Preparation of Updated Traffic Analysis

In addition to the TDM measures identified above, Berkeley Lab intends to prepare an updated traffic analysis pursuant to a "reopener" negotiated with the City of Berkeley to evaluate traffic impacts related to future development at the Lab. The updated traffic analysis will be prepared on the earliest to occur of ten years from the date that Berkeley Lab's Long Range Development Plan EIR is certified or the date upon which development at the Lab pursuant to the Long Range Development Plan reaches 375 net new parking spaces. When the earliest of these thresholds is reached, Berkeley Lab will conduct the new traffic study, circulate that traffic study for review subject to the California Environmental Quality Act, and consider whether further mitigation measures or modifications to the Long Range Development Plan should be adopted based upon that traffic study. The new traffic study may be conducted as part of a further project review or independently as a supplement to the Long Range Development Plan EIR. Consistent with this TDM Program, it is anticipated that the new traffic study will assist in reducing total vehicle trips to and within Berkeley Lab, reducing air emissions, traffic impacts, and parking demands.

APPENDIX G

U.S. Department of Energy Policy Statement on Nanoscale Safety

U.S. Department of Energy
Washington, D.C.

POLICY

DOE P 456.1

9-15-05

SUBJECT: SECRETARIAL POLICY STATEMENT ON NANOSCALE SAFETY

PURPOSE AND SCOPE

The safety of its employees, the public, and the environment is the Department's number one priority. This policy statement is issued to establish a framework for working safely with nanomaterials.

Nanomaterials exhibit unique properties that can affect physical, chemical and biological attributes. Much of the scientific information on the safety, health and environmental hazards of working with these materials is yet to be determined. With the establishment of the Department's Nanoscale Science Research Centers and other emerging programs, research and development in nanoscience will increase significantly for the foreseeable future.

POLICY

The Department of Energy (DOE) requires that all work with nanomaterials be conducted in a safe and responsible manner that protects workers, the public, and the environment. Thus, the Department must be prudent and follow a cautious approach in the production, use, and disposition of nanomaterials.

It is imperative that the Department's work with nanomaterials be conducted in a manner that encompasses the following attributes:

- DOE will adopt and implement, as appropriate, both existing and future environment, safety and health best practices, "National Consensus Standards," and guidance relating to nanotechnology developed by recognized standard-setting organizations. Further, any existing DOE Directives and Standards which contain provisions that are relevant to nanotechnology work must be appropriately applied.

- DOE and its contractors will identify and manage potential health and safety hazards and potential environmental impacts at sites through the use of existing Integrated Safety Management Systems, including Environmental Management Systems.

- DOE organizations working with nanomaterials will stay abreast of current research and guidance relating to the potential hazards and impacts of nanomaterials, and will ensure that this best current knowledge is reflected in the identification and control of these potential hazards and impacts at their facilities.

- DOE will continue to both support research on the environmental and safety and health impacts of nanomaterials, and participate in government-wide activities aimed at identifying and resolving potential environmental, safety, and health issues.

RESPONSIBILITIES

Everyone involved with nanotechnology research and development activities shares responsibility for protecting the safety and health of workers and the public, and in safeguarding the environment from the hazards presented by the conduct of their activities. Authorized DOE employees (or personnel) are responsible for conveying to contractors and grantees the expectation that appropriate programs must be in place to maintain a level of worker, public, and environmental safety consistent with the intent of this policy.

SAMUEL W. BODMAN
Secretary of Energy

APPENDIX H

Scientific Achievements at the Lawrence Berkeley National Laboratory

75 Milestones in 75 Years:
Achievements at the Lawrence Berkeley National Laboratory

- **Invention of the cyclotron** - circular particle accelerator that won the 1939 Nobel Prize in Physics for E.O. Lawrence
- **Technetium-99 discovered –** first artificial element created would become most widely used radioisotope in medicine
- **60-inch cyclotron built** – gave birth to the Crocker Radiation Laboratory and nuclear medicine
- **Neptunium and Plutonium discovered –** first transuranic elements produced, won 1951 Nobel Prize in chemistry for Edwin McMillan and Glenn Seaborg
- **Carbon-14 discovered –** became an atomic clock for dating human artifacts
- **184-inch synchrocyclotron built –** took the Rad Lab from UC Berkeley campus to current location in Berkeley Hills
- **First proton linear accelerator invented** - type of accelerator used in oncology clinics today for cancer treatments
- **Berkelium discovered** – radioactive rare earth metal named for the city of Berkeley
- **Anger camera invented –** Hal Anger develops the first gamma ray camera for imaging radioisotopes in tissue
- **Liquid-hydrogen bubble chamber invented –** won the 1960 Nobel Prize in Physics for its inventor, Donald Glaser
- **Bevatron built** – accelerator smashed the billion electron volt (GeV) barrier for protons
- **Antiproton discovered –** won 1959 Nobel Prize in Physics for Emilio Segrè and Owen Chamberlain
- **Antineutron discovered** – antimatter or mirror matter was extended to include the electrically neutral elementary particles
- **Photosynthesis path of carbon identified –** won the 1961 Nobel Prize in Chemistry for Melvin Calvin
- **Lawrencium discovered** - radioactive rare earth metal named after Berkeley Lab founder Ernest O. Lawrence
- **88-Inch Cyclotron opens –** still in use today for the study of ionizing radiation effects on space-based electronics
- **Chemical laser invented –** became one of the most versatile and widely used tools of science

- **Discovery of "resonance states" in elementary particles –** won for Luis Alvarez the 1968 Nobel Prize in Physics
- **Positron Emission Tomography breakthrough –** world's highest resolution PET scanner developed for diagnostics research
- **j/psi particle discovered –** a meson that contained the first evidence of the charm quark
- **Seaborgium discovered –** radioactive synthetic element named after Berkeley Lab Nobelist Glenn Seaborg
- **Bevalac created –** SuperHILAC and Bevatron accelerators are joined to accelerate heavy ions to relativistic energies
- **Time Projection Chamber invented –** TPCs remain the workhorse of high energy physics particle detectors
- **Superconducting magnet breaks TESLA record –** Lab becomes world leader in superconducting electromagnetic technology
- **Positron-Electron Project built at Stanford -** joint project with SLAC produces first matter-antimatter collider
- **Earthquake studies begin at Parkfield –** Lab becomes a leader in subsurface imaging technology
- **Ten Meter Telescope conceived –** proposed segmented reflecting mirror now used in the world's largest optical telescopes
- **SQUIDs invented –** superconducting quantum interference devices for measuring ultra-tiny magnetic fields
- **Smart Windows invented –** embedded electrodes enable window glass to respond to changes in sunlight
- **Dinosaur Die Out –** iridium anomaly at the K-T boundary links dinosaur extinction to asteroid collision with Earth
- **National Center for Electron Microscopy (NCEM) opens –** home to the world's most powerful electron microscopes, will produce first images of carbon atoms in a lattice
- **DOE-2 program created –** energy-saving computational program for modeling heating, lighting and air-conditioning costs
- **Collective flow observed –** first direct evidence that nuclear matter can be compressed to high temperature and density launches the search for a Quark Gluon Plasma
- **Crossed molecular beam research –** wins for Yuan T. Lee the 1988 Nobel Prize in Chemistry
- **NMR Magic Angle and Double-rotation invented –** first of a series of new techniques that will extend nuclear magnetic resonance technology from solids to liquids and gases
- **Good and bad cholesterol identified –** two forms of lipoproteins found in cholesterol, high-density and low-density, the former good, the latter bad for heart disease
- **Solid-state ballasts for fluorescent lamps –** high-frequency electronic ballasts lead to the commercial development of compact fluorescent lamps
- **MBE-4 inertital fusion energy experiments -** linac accelerates and focuses parallel heavy ion beams to 1 MeV, provides an alternative to magnetic fusion energy

- **Arctic soot discovered –** Lab aetholometers reveal large concentrations of radiation-absorbing black particles at the North Pole, demonstrates pollution is global issue
- **Random Vortex Method invented –** mathematical model describes turbulent flow, the most common form of motion in the universe
- **Next generation of aerogels created –** Lab develops materials that are 96-percent air, results in first commercial U.S. aerogel firm
- **Immortal human epithelial cell lines established –** creation of cells that live indefinitely in culture opens new doors to cancer research
- **Radon risk uncovered –** radon gas seeping into homes through basements found to pose substantial radiation hazard in some parts of the country
- **Center for Science and Engineering Education starts –** CSEE begins on-going outreach programs to teachers and students in K-12, community college, undergraduate and graduate science education programs
- **Extra Cellular Matrix theory proposed –** ground-breaking theory links breast cancer development to breakdown in the micro-environment surrounding breast cells
- **Human Genome Project begins –** Lab named one of two DOE centers for mapping and sequencing human genome, a project that will be successfully completed in 2003
- **Solid polymer batteries invented -** novel class of polymer cathodes makes possible a new family of lightweight rechargeable batteries
- **COBE satellite records seeds of early universe –** Lab detectors aboard NASA satellite reveal fluctuations in the cosmic microwave background that gave rise to today's galaxies - wins for George Smoot the 2006 Nobel Prize in Physics
- **Advanced Light Source opens –** generates world's brightest beams of soft x-rays and ultraviolet light for scientific research
- **Heart disease gene identified –** new evidence links atherosclerosis to a single dominant gene
- **ultrahard carbon-nitride –** new compound designed on basis of theoretical model is tougher than diamond
- **First view of DNA double-helix –** image of unaltered DNA gives scientists their first look at the double-helix
- **Kesterson Reservoir threat uncovered –** Lab discovery of selenium contamination of wildlife refuge by agriculture runoff exposes widespread ecological danger
- **First femtosecond x-ray beam –** pulse lengths of ALS beam sliced to barely a few hundred millionths of a billionth of a second
- **Sulfur lamp invented –** Lab scientists help produce molecular emitter four times more energy efficient and 700 times brighter than conventional incandescent bulbs
- **NERSC moves to Berkeley Lab –** Lab becomes host of National Energy Research Scientific Computing Center, flagship scientific computing facility for the Office of Science in the U.S. Department of Energy
- **Cell senescence linked to cancer –** bioassay enables scientists to identify senescent cells within living organisms and find link to cancer
- **Gammasphere unveiled –** world's most sensitive detector of gamma radiation inspires production of Hollywood blockbuster film, *The Hulk*
- **B factory conceived** – collaboration with SLAC to build first asymmetric particle collider, called B factory, which will go on to reveal first evidence of CP violation

- **Sickle cell and Down syndrome transgenic mice –** mouse models carrying human genes mimic sickle cell disease and link DYRK gene to mental retardation in Down syndrome
- **TCP/IP flow control algorithms –** algorithms developed at Lab substantially reduce network traffic congestion and are widely credited with saving the Internet from an otherwise inevitable congestion collapse
- **Top quark discovered –** Lab scientists part of two historic experiments at Tevatron, CDF and D-Zero, that find the last and most elusive of the six predicted quarks
- **UV water purifier prevents cholera outbreaks –** ultraviolet light quickly and cheaply disinfects water in remote locations
- **3-D computer model of Yucca Mountain –** hydrogeologic model shows Nevada mountain to be a sound choice for nuclear waste repository
- **Dark energy discovered –** Supernova Cosmology Project reveals antigravity force called "dark energy" that is causing the expansion of the universe to accelerate
- **First 3-D atomic-scale model of tubulin –** image reveals structure of flexible protein that enables biological cells to undergo mitosis and other critical functions
- **Front-end system for Spallation Neutron Source completed –** Lab completes work on accelerator that generates negative hydrogen ions for SNS and sends to Oak Ridge, TN.
- **First results from SNO show neutrino mass –** first year of data from SNO reveals a tiny mass for ghostlike subatomic particles
- **Hybrid solar cells developed –** nanotechnology combined with plastic electronics yields photovoltaic devices that can be mass-produced in a multitude of different shapes
- **Southern Ocean and Frio tests –** Lab begins carbon sequestration studies off the Antarctic coast and in deep brine aquifers near Houston, Texas
- **Lilliputian lasers invented –** UV light-emitting nanowire lasers measure 100 nanometers in diameter, or one-thousandth that of a human hair
- **Berkeley Lamp invented –** fluorescent table lamp reduces energy costs by 50-percent over conventional desk lamps
- **Synthetic biology breakthroughs** – first SB department at major institute creates synthetic genes for antimalaria and anti-AIDS superdrugs
- **World's smallest synthetic motor created** - rotational motor fashioned out of carbon nanotubes and gold measures less than 300 nanometers in length
- **Molecular Foundry opens –** DOE national user facility dedicated to design, synthesis and characterization of nanoscale materials

APPENDIX I
Intersection Level of Service Data

To save paper, this appendix is included in the electronic version of the Draft EIR but is not included in the hard copy version. A hard copy of this appendix (approximately 340 pages) is available upon request from Berkeley Lab, at (510) 486-5257.

This appendix contains the traffic count volumes on which the intersection level of service (LOS) calculations in the EIR were based, as well as those LOS calculations themselves.

To ensure that the previously counted turning movement volumes adequately represent current conditions, new traffic counts were undertaken at each of the study intersections in October 2006 (when UC Berkeley and City of Berkeley schools were in session). In general, the volumes counted in 2006 were lower than those counted previously, with 18 of 20 intersections having current volumes in both the a.m. and p.m. peak hours that were between 3 percent and 39 percent lower than those counted earlier. The average decline was 14 percent in the morning and 13 percent in the afternoon. Exceptions were at Centennial/Stadium Rim Way (a.m. peak hour, 5-percent increase, but overall volumes remain very low), and Dwight/Piedmont-Warring and College/Bancroft (p.m. peak hour, 9-percent and 4-percent increases, respectively, with little or no increase in the conflicting movements that determine level of service). At the Panoramic Way/Canyon Road/Stadium Rim Way intersection, a.m. peak-hour volumes were essentially unchanged (although p.m. peak-hour volumes declined by 20 percent between the 2003 and 2006 counts). All intersections where volumes increased between the prior counts and the 2006 counts currently operate (and will operate in the future) at good levels of service (LOS B or C). The October 2006 counts were also compared to the volumes counted for the UC Berkeley Southeast Campus Integrated Projects (SCIP) EIR (taken in January 2006). Once again, the current counts are lower, except at Centennial/Stadium Rim Way (a.m. peak hour, increase of 33 percent but, as stated above, the overall volume was low and the level of service remained good) and Bancroft/Gayley-Piedmont (p.m. peak hour, increase of 5 percent, but there was a decrease in conflicting movements that determine level of service).

Existing Conditions—A.M. Peak Hour

```
-----------------------------------------------------------------------------------
                           LBNL + UC Berkeley LRDP EIR
                               Existing Conditions
                                  AM Peak Hour
-----------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
***********************************************************************************
Intersection #1 Marin Avenue / San Pablo Avenue
***********************************************************************************
Cycle (sec):       100             Critical Vol./Cap. (X):        0.852
Loss Time (sec):    16 (Y+R =  4 sec) Average Delay (sec/veh):     79.2
Optimal Cycle:     100             Level Of Service:                  E
***********************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     102  363    59   106  891    15    38  672   235   147  768    90
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  102  363    59   106  891    15    38  672   235   147  768    90
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:   112  399    65   116  979    16    42  738   258   162  844    99
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  112  399    65   116  979    16    42  738   258   162  844    99
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   112  399    65   116  979    16    42  738   258   162  844    99
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.95  0.95  0.95 0.91  0.91  0.95 0.93  0.93
Lanes:       1.00 1.72  0.28  1.00 1.97  0.03  1.00 1.48  0.52  1.00 1.79  0.21
Final Sat.:  1805 3040   494  1805 3540    60  1805 2570   899  1805 3180   373
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.13  0.13  0.06 0.28  0.28  0.02 0.29  0.29  0.09 0.27  0.27
Crit Moves:  ****                  ****              ****        ****
Green/Cycle: 0.12 0.36  0.36  0.12 0.36  0.36  0.17 0.21  0.21  0.15 0.35  0.35
Volume/Cap:  0.52 0.36  0.36  0.54 0.77  0.77  0.14 1.37  1.37  0.60 0.76  0.76
Delay/Veh:   43.5 23.8  23.8  44.1 31.2  31.2  35.5  214 213.9  43.3 31.5  31.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  43.5 23.8  23.8  44.1 31.2  31.2  35.5  214 213.9  43.3 31.5  31.5
DesignQueue:    6   15     2     6   37     1     2   34    12     8   32     4
***********************************************************************************
```



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-----------------------------------------------------------------------------------
                           LBNL + UC Berkeley LRDP EIR
                               Existing Conditions
                                  AM Peak Hour
-----------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
***********************************************************************************
Intersection #2 Marin Avenue / The Alameda
***********************************************************************************
Cycle (sec):        65             Critical Vol./Cap. (X):        0.506
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):     13.2
Optimal Cycle:      56             Level Of Service:                  B
***********************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   25    25    25   25    25    25   23    23    23   23    23    23
Lanes:       0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     173  189     7    38  279    23    33  494   291    20  420    48
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  173  189     7    38  279    23    33  494   291    20  420    48
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:   186  203     8    41  300    25    35  531   313    22  452    52
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  186  203     8    41  300    25    35  531   313    22  452    52
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   186  203     8    41  300    25    35  531   313    22  452    52
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.63 0.63  0.63  0.83 0.83  0.83  0.83 0.83  0.83  0.85 0.85  0.85
Lanes:       0.94 1.02  0.04  0.22 1.64  0.14  0.08 1.21  0.71  0.08 1.72  0.20
Final Sat.:  1131 1235    46   353 2593   214   127 1901  1120   133 2785   318
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.16  0.16  0.12 0.12  0.12  0.28 0.28  0.28  0.16 0.16  0.16
Crit Moves:       ****                              ****
Green/Cycle: 0.45 0.45  0.45  0.45 0.45  0.45  0.46 0.46  0.46  0.46 0.46  0.46
Volume/Cap:  0.36 0.36  0.36  0.25 0.25  0.25  0.61 0.61  0.61  0.35 0.35  0.35
Delay/Veh:   12.5 12.5  12.5  11.4 11.4  11.4  15.0 15.0  15.0  11.9 11.9  11.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  12.5 12.5  12.5  11.4 11.4  11.4  15.0 15.0  15.0  11.9 11.9  11.9
DesignQueue:    4    4     0     1    6     0     1   11     6     0    9     1
***********************************************************************************
```

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--------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Gilman Street / Sixth Street
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.578
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        11.5
Optimal Cycle:       46               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    19   19    19    19   19    19    19   19    19    19   19    19
Lanes:        0  0  1! 0  0   0  1  0  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     122   24    56    11   45    28    21  416   114    47  430    20
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  122   24    56    11   45    28    21  416   114    47  430    20
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89
PHF Volume:   137   27    63    12   51    31    24  467   128    53  483    22
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  137   27    63    12   51    31    24  467   128    53  483    22
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   137   27    63    12   51    31    24  467   128    53  483    22
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.73 0.73  0.73  0.83 0.83  0.83  0.95 0.95  0.95  0.91 0.91  0.91
Lanes:       0.60 0.12  0.28  0.26 1.07  0.67  0.04 0.75  0.21  0.09 0.87  0.04
Final Sat.:   842  166   387   412 1685  1048    69 1359   373   163 1495    70
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.16  0.16  0.03 0.03  0.03  0.34 0.34  0.34  0.32 0.32  0.32
Crit Moves:       ****                              ****
Green/Cycle: 0.32 0.32  0.32  0.32 0.32  0.32  0.62 0.62  0.62  0.62 0.62  0.62
Volume/Cap:  0.50 0.50  0.50  0.09 0.09  0.09  0.56 0.56  0.56  0.53 0.53  0.53
Delay/Veh:   21.8 21.8  21.8  15.5 15.5  15.5   9.4  9.4   9.4   9.0  9.0   9.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  21.8 21.8  21.8  15.5 15.5  15.5   9.4  9.4   9.4   9.0  9.0   9.0
DesignQueue:    3    1     2     0    1     1     0    7     2     1    7     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #4 Gilman Street / San Pablo Avenue
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.812
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):        41.0
Optimal Cycle:       82               Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     4   35    35     4   35    35    31   31    31    31   31    31
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     113  401    25    74 1055   125    75  189    96    62  318    42
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  113  401    25    74 1055   125    75  189    96    62  318    42
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:   124  441    27    81 1159   137    82  208   105    68  349    46
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  124  441    27    81 1159   137    82  208   105    68  349    46
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   124  441    27    81 1159   137    82  208   105    68  349    46
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.63 0.63  0.63  0.87 0.87  0.87
Lanes:       1.00 1.88  0.12  1.00 1.79  0.21  0.42 1.05  0.53  0.15 0.75  0.10
Final Sat.:  1805 3368   210  1805 3176   376   497 1252   636   243 1246   165
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.13  0.13  0.05 0.37  0.37  0.17 0.17  0.17  0.28 0.28  0.28
Crit Moves:  ****                  ****                              ****
Green/Cycle: 0.15 0.37  0.37  0.15 0.37  0.37  0.37 0.37  0.37  0.37 0.37  0.37
Volume/Cap:  0.46 0.35  0.35  0.30 0.99  0.99  0.45 0.45  0.45  0.77 0.77  0.77
Delay/Veh:   44.3 23.6  23.6  40.7 53.1  53.1  25.9 25.9  25.9  37.1 37.1  37.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  44.3 23.6  23.6  40.7 53.1  53.1  25.9 25.9  25.9  37.1 37.1  37.1
DesignQueue:    6   16     1     4   44     5     3    7     4     3   13     2
********************************************************************************
```

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------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #5 Rose Street / Shattuck Avenue
******************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):        0.505
Loss Time (sec):       8 (Y+R =  5 sec) Average Delay (sec/veh):        7.1
Optimal Cycle:        52               Level Of Service:                 A
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    17   17    17    17   17    17    27   27    27    27   27    27
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      55  191    11   174  961    28    28  174    40    32  185    40
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   55  191    11   174  961    28    28  174    40    32  185    40
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    58  201    12   183 1012    29    29  183    42    34  195    42
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   58  201    12   183 1012    29    29  183    42    34  195    42
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    58  201    12   183 1012    29    29  183    42    34  195    42
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.25 0.94  0.94  0.61 0.95  0.95  0.94 0.94  0.85  0.93 0.93  0.93
Lanes:       1.00 1.89  0.11  1.00 1.94  0.06  0.14 0.86  1.00  0.12 0.72  0.16
Final Sat.:   479 3386   195  1161 3494   102   247 1534  1615   219 1267   274
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.06  0.06  0.16 0.29  0.29  0.12 0.12  0.03  0.15 0.15  0.15
Crit Moves:                        ****                              ****
Green/Cycle: 0.50 0.50  0.50  0.50 0.50  0.50  0.42 0.42  0.42  0.42 0.42  0.42
Volume/Cap:  0.24 0.12  0.12  0.32 0.58  0.58  0.28 0.28  0.06  0.36 0.36  0.36
Delay/Veh:    5.5  3.0   3.0   4.6  5.2   5.2  13.2 13.2  11.3  14.2 14.2  14.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   5.5  3.0   3.0   4.6  5.2   5.2  13.2 13.2  11.3  14.2 14.2  14.2
DesignQueue:    1    4     0     3   19     1     1    4     1     1    4     1
******************************************************************************
```



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------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #6 Cedar Street / Martin Luther King Way
******************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):        0.694
Loss Time (sec):       8 (Y+R =  5 sec) Average Delay (sec/veh):       17.2
Optimal Cycle:        48               Level Of Service:                 B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    20   20    20    20   20    20    20   20    20    20   20    20
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      33  292    44    35  617    26    14  276    62    58  248    30
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   33  292    44    35  617    26    14  276    62    58  248    30
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    34  304    46    36  643    27    15  288    65    60  258    31
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   34  304    46    36  643    27    15  288    65    60  258    31
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    34  304    46    36  643    27    15  288    65    60  258    31
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.90 0.90  0.90  0.96 0.96  0.96  0.96 0.96  0.96  0.83 0.83  0.83
Lanes:       0.09 0.79  0.12  0.05 0.91  0.04  0.04 0.78  0.18  0.17 0.74  0.09
Final Sat.:   153 1355   204    94 1665    70    72 1425   320   272 1162   141
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.22  0.22  0.39 0.39  0.39  0.20 0.20  0.20  0.22 0.22  0.22
Crit Moves:                        ****                              ****
Green/Cycle: 0.54 0.54  0.54  0.54 0.54  0.54  0.31 0.31  0.31  0.31 0.31  0.31
Volume/Cap:  0.42 0.42  0.42  0.72 0.72  0.72  0.66 0.66  0.66  0.72 0.72  0.72
Delay/Veh:    7.7  7.7   7.7  12.4 12.4  12.4  25.4 25.4  25.4  29.0 29.0  29.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   7.7  7.7   7.7  12.4 12.4  12.4  25.4 25.4  25.4  29.0 29.0  29.0
DesignQueue:    1    5     1     1   12     0     0    7     2     2    7     1
******************************************************************************
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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
               2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #7 Cedar Street / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.567
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       9.7
Optimal Cycle:       50              Level Of Service:                A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    20   20    20   20   20    20   22   22    22   22   22    22
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      48  256    41  127  933    52   44  257    86   94  268    56
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   48  256    41  127  933    52   44  257    86   94  268    56
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93
PHF Volume:    52  275    44  137 1003    56   47  276    92  101  288    60
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   52  275    44  137 1003    56   47  276    92  101  288    60
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    52  275    44  137 1003    56   47  276    92  101  288    60
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.26 0.93  0.93 0.55 0.94  0.94 0.39 0.96  0.96 0.37 0.97  0.97
Lanes:       1.00 1.72  0.28 1.00 1.89  0.11 1.00 0.75  0.25 1.00 0.83  0.17
Final Sat.:   502 3046   488 1053 3392   189  743 1370   458  695 1531   320
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.09  0.09 0.13 0.30  0.30 0.06 0.20  0.20 0.15 0.19  0.19
Crit Moves:                       ****             ****
Green/Cycle: 0.53 0.53  0.53 0.53 0.53  0.53 0.34 0.34  0.34 0.34 0.34  0.34
Volume/Cap:  0.19 0.17  0.17 0.24 0.56  0.56 0.19 0.60  0.60 0.43 0.56  0.56
Delay/Veh:    3.6  2.1   2.1  3.1  3.7   3.7 16.8 22.0  22.0 22.3 21.1  21.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   3.6  2.1   2.1  3.1  3.7   3.7 16.8 22.0  22.0 22.3 21.1  21.1
DesignQueue:    1    5     1    2   18     1    1    7     2    2    7     1
********************************************************************************
```



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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
               2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #8 Cedar Street / Oxford Street
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.928
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      49.4
Optimal Cycle:       92              Level Of Service:                D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16   16   16    16   16   16    16   16   16    16
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      45  186    56   34  531    19   18  314    75  144  343    19
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   45  186    56   34  531    19   18  314    75  144  343    19
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:    50  207    62   38  590    21   20  349    83  160  381    21
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   50  207    62   38  590    21   20  349    83  160  381    21
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    50  207    62   38  590    21   20  349    83  160  381    21
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.84 0.84  0.84 0.96 0.96  0.96 0.95 0.95  0.95 0.64 0.64  0.64
Lanes:       0.16 0.65  0.19 0.06 0.91  0.03 0.04 0.78  0.18 0.28 0.68  0.04
Final Sat.:   250 1031   311  107 1666    60   80 1391   332  348  829    46
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.20 0.20  0.20 0.35 0.35  0.35 0.25 0.25  0.25 0.46 0.46  0.46
Crit Moves:                       ****                              ****
Green/Cycle: 0.49 0.49  0.49 0.49 0.49  0.49 0.38 0.38  0.38 0.38 0.38  0.38
Volume/Cap:  0.41 0.41  0.41 0.73 0.73  0.73 0.66 0.66  0.66 1.21 1.21  1.21
Delay/Veh:   10.0 10.0  10.0 15.5 15.5  15.5 21.6 21.6  21.6 133.1  133 133.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  10.0 10.0  10.0 15.5 15.5  15.5 21.6 21.6  21.6 133.1  133 133.1
DesignQueue:    1    4     1    1   12     0    0    8     2    4    9     1
********************************************************************************
```

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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #9 Cedar Street / Euclid Avenue
********************************************************************************
Cycle (sec):         60              Critical Vol./Cap. (X):        0.570
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       13.1
Optimal Cycle:       42              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    17   17    17   17   17    17   17   17    17   17   17    17
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      30   85    29   23  295   141   50  143   117   28  209     8
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   30   85    29   23  295   141   50  143   117   28  209     8
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:    33   94    32   26  328   157   56  159   130   31  232     9
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   33   94    32   26  328   157   56  159   130   31  232     9
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    33   94    32   26  328   157   56  159   130   31  232     9
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.85 0.85  0.85 0.94 0.94  0.94 0.86 0.86  0.86 0.93 0.93  0.93
Lanes:       0.21 0.59  0.20 0.05 0.64  0.31 0.16 0.46  0.38 0.11 0.86  0.03
Final Sat.:   335  950   324   90 1151   550  265  758   620  202 1509    58
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.10  0.10 0.28 0.28  0.28 0.21 0.21  0.21 0.15 0.15  0.15
Crit Moves:                       ****             ****
Green/Cycle: 0.50 0.50  0.50 0.50 0.50  0.50 0.37 0.37  0.37 0.37 0.37  0.37
Volume/Cap:  0.20 0.20  0.20 0.57 0.57  0.57 0.57 0.57  0.57 0.42 0.42  0.42
Delay/Veh:    8.5  8.5   8.5 11.4 11.4  11.4 16.5 16.5  16.5 14.6 14.6  14.6
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   8.5  8.5   8.5 11.4 11.4  11.4 16.5 16.5  16.5 14.6 14.6  14.6
DesignQueue:    1    2     1    0    6     3    1    3     3    1    5     0
********************************************************************************
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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #10 Grizzly Peak Blvd / Centennial Drive
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.416
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       10.2
Optimal Cycle:        0              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 7:00-9:00 AM
Base Vol:      31   13    13   25   52     4    6  165   143  169   90    16
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   31   13    13   25   52     4    6  165   143  169   90    16
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:    33   14    14   27   55     4    6  176   152  180   96    17
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   33   14    14   27   55     4    6  176   152  180   96    17
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    33   14    14   27   55     4    6  176   152  180   96    17
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.54 0.23  0.23 0.31 0.64  0.05 0.02 0.53  0.45 0.61 0.33  0.06
Final Sat.:   327  137   137  187  389    30   15  422   365  454  242    43
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.10  0.10 0.14 0.14  0.14 0.42 0.42  0.42 0.40 0.40  0.40
Crit Moves:       ****             ****        ****                  ****
Delay/Veh:    8.9  8.9   8.9  9.2  9.2   9.2 10.3 10.3  10.3 10.7 10.7  10.7
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   8.9  8.9   8.9  9.2  9.2   9.2 10.3 10.3  10.3 10.7 10.7  10.7
LOS by Move:    A    A     A    A    A     A    B    B     B    B    B     B
ApproachDel:        8.9              9.2             10.3             10.7
Delay Adj:         1.00             1.00             1.00             1.00
ApprAdjDel:         8.9              9.2             10.3             10.7
LOS by Appr:          A                A                B                B
********************************************************************************
```

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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #11 Hearst Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.434
Loss Time (sec):      8 (Y+R =  6 sec) Average Delay (sec/veh):        6.1
Optimal Cycle:       52              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   22   22    22   22   22    22   22   22    22   22   22    22
Lanes:         1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      19  291    43  199  810    57   31  278    24   11  225    51
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   19  291    43  199  810    57   31  278    24   11  225    51
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:    21  320    47  219  890    63   34  305    26   12  247    56
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   21  320    47  219  890    63   34  305    26   12  247    56
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    21  320    47  219  890    63   34  305    26   12  247    56
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.30 0.93  0.93 0.53 0.94  0.94 0.85 0.85  0.85 0.87 0.87  0.87
Lanes:       1.00 1.74  0.26 1.00 1.87  0.13 0.19 1.67  0.14 0.08 1.57  0.35
Final Sat.:   574 3085   456 1011 3339   235  299 2683   232  126 2577   584
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.10  0.10 0.22 0.27  0.27 0.11 0.11  0.11 0.10 0.10  0.10
Crit Moves:                        ****             ****
Green/Cycle: 0.56 0.56  0.56 0.56 0.56  0.56 0.36 0.36  0.36 0.36 0.36  0.36
Volume/Cap:  0.06 0.18  0.18 0.38 0.47  0.47 0.32 0.32  0.32 0.27 0.27  0.27
Delay/Veh:    1.3  1.2   1.2  3.1  2.0   2.0 16.0 16.0  16.0 15.5 15.5  15.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   1.3  1.2   1.2  3.1  2.0   2.0 16.0 16.0  16.0 15.5 15.5  15.5
DesignQueue:    0    5     1    4   15     1    1    7     1    0    6     1
********************************************************************************
```



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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #12 Hearst Avenue / Oxford Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.487
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       10.0
Optimal Cycle:       49              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   19   19    19   19   19    19   22   22    22   22   22    22
Lanes:         1  0  1  1  0   0  1  0  1  0   0  1  0  1  0   1  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      46  328   374   48  841    38   10  399   114  207  281    27
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   46  328   374   48  841    38   10  399   114  207  281    27
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:    49  349   398   51  895    40   11  424   121  220  299    29
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   49  349   398   51  895    40   11  424   121  220  299    29
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    49  349   398   51  895    40   11  424   121  220  299    29
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
Lanes:       1.00 1.00  1.00 0.10 1.82  0.08 0.04 1.52  0.44 1.20 1.64  0.16
Final Sat.:  1900 1805  1805  187 3275   148   69 2754   787 2177 2955   284
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.19  0.22 0.27 0.27  0.27 0.15 0.15  0.15 0.10 0.10  0.10
Crit Moves:                        ****             ****
Green/Cycle: 0.52 0.52  0.52 0.52 0.52  0.52 0.42 0.42  0.42 0.42 0.42  0.42
Volume/Cap:  0.05 0.37  0.42 0.52 0.52  0.52 0.37 0.37  0.37 0.24 0.24  0.24
Delay/Veh:    5.6  7.2   7.7  8.5  8.5   8.5 13.8 13.8  13.8 12.6 12.6  12.6
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   5.6  7.2   7.7  8.5  8.5   8.5 13.8 13.8  13.8 12.6 12.6  12.6
DesignQueue:    1    6     7    1   16     1    0    9     3    5    6     1
********************************************************************************
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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #13 Hearst Avenue / Spruce Street
*******************************************************************************
Average Delay (sec/veh):      0.7          Worst Case Level Of Service:       B
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  0  0  0    0  0  1! 0  0    0  1  1  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0    0     9    0    63    11  843    0     0  430     7
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0    0     9    0    63    11  843    0     0  430     7
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    0    0    0     9    0    66    12  887    0     0  453     7
Reduct Vol:    0    0    0     0    0     0     0    0    0     0    0     0
Final Vol.:    0    0    0     9    0    66    12  887    0     0  453     7
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   923 xxxx   230   460 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   272 xxxx   779  1112 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   270 xxxx   779  1112 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.3 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *    *     *    *     *     A    *    *     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  630 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.5 xxxxx   8.3 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *    *     *    B     *     A    *    *     *    *     *
ApproachDel:    xxxxxx            11.5            xxxxxx           xxxxxx
ApproachLOS:       *                B                *                *
```



```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #14 Hearst Avenue / Arch Street / Le Conte Avenue
*******************************************************************************
Average Delay (sec/veh):      3.0          Worst Case Level Of Service:       B
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0    0     2    0   130   276  566    0     0  307     4
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0    0     2    0   130   276  566    0     0  307     4
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    0    0    0     2    0   138   294  602    0     0  327     4
Reduct Vol:    0    0    0     0    0     0     0    0    0     0    0     0
Final Vol.:    0    0    0     2    0   138   294  602    0     0  327     4
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1217 xxxx   165   331 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   176 xxxx   856  1240 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   144 xxxx   856  1240 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *    *     *    *     *     A    *    *     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  797 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 10.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *    *     *    B     *     *    *    *     *    *     *
ApproachDel:    xxxxxx            10.5            xxxxxx           xxxxxx
ApproachLOS:       *                B                *                *
```

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--------------------------------------------------------------------------------
                           LBNL + UC Berkeley LRDP EIR
                               Existing Conditions
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #15 Hearst Avenue / Scenic Avenue
********************************************************************************
Average Delay (sec/veh):      0.4          Worst Case Level Of Service:        A
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:          Include          Include          Include           Include
Lanes:       0  0  0  0  0    0  0  0  0  1    0  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:       0    0     0     0    0    37     0  531     0     0  290    55
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0    0    37     0  531     0     0  290    55
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:     0    0     0     0    0    40     0  571     0     0  312    59
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0     0    0    40     0  571     0     0  312    59
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx   185  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx   831  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx   831  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx   9.5 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     A     *    *     *     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx              9.5            xxxxxx            xxxxxx
ApproachLOS:        *                 A                *                 *
```



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--------------------------------------------------------------------------------
                           LBNL + UC Berkeley LRDP EIR
                               Existing Conditions
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #16 Hearst Avenue / Euclid Avenue
********************************************************************************
Cycle (sec):         65                Critical Vol./Cap. (X):        0.471
Loss Time (sec):     12 (Y+R =  3 sec) Average Delay (sec/veh):        15.4
Optimal Cycle:       58                Level Of Service:                  B
********************************************************************************
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted       Prot+Permit       Permitted
Rights:          Include           Include          Include           Include
Min. Green:     0    0     0    25   25    25     5   16    16    16   16    16
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  0  1  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00-9:00 AM
Base Vol:       2    0     2    47    1   151    75  448     1     1  276    10
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    2    0     2    47    1   151    75  448     1     1  276    10
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     2    0     2    50    1   161    80  477     1     1  294    11
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    2    0     2    50    1   161    80  477     1     1  294    11
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     2    0     2    50    1   161    80  477     1     1  294    11
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.88 1.00  0.88  0.84 0.84  0.84  0.84 1.00  1.00  1.00 1.00  1.00
Lanes:       0.50 0.00  0.50  0.23 0.01  0.76  1.00 0.99  0.01  0.01 0.96  0.03
Final Sat.:   831    0   831   377    8  1212  1605 1896     4     7 1818    66
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.13 0.13  0.13  0.05 0.25  0.25  0.16 0.16  0.16
Crit Moves:                        ****        ****                   ****
Green/Cycle: 0.40 0.40  0.40  0.40 0.40  0.40  0.51 0.51  0.51  0.31 0.31  0.31
Volume/Cap:  0.01 0.00  0.01  0.33 0.33  0.33  0.10 0.50  0.50  0.52 0.52  0.52
Delay/Veh:   11.7  0.0  11.7  14.9 14.9  14.9   9.7 12.3  12.3  21.9 21.9  21.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  11.7  0.0  11.7  14.9 14.9  14.9   9.7 12.3  12.3  21.9 21.9  21.9
DesignQueue:    0    0     0     1    0     4     2    9     0     0    8     0
********************************************************************************
```

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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #17 Hearst Avenue / Le Roy Avenue
*******************************************************************************
Average Delay (sec/veh):      1.7          Worst Case Level Of Service:       B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:        0    0     0   19    0    60   59  436     0    0  230     3
Growth Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:     0    0     0   19    0    60   59  436     0    0  230     3
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:      0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:      0    0     0   20    0    64   63  464     0    0  245     3
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Final Vol.:      0    0     0   20    0    64   63  464     0    0  245     3
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   739 xxxx   246   248 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   353 xxxx   797  1330 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   340 xxxx   797  1330 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  603 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.9 xxxxx   7.8 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            11.9            xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```



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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #18 Hearst Avenue / Gayley Road / LaLoma Avenue
*******************************************************************************
Cycle (sec):          65                Critical Vol./Cap. (X):        0.924
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        22.4
Optimal Cycle:        91                Level Of Service:                  C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18   18   18    18   17   17    17   17   17    17
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00-9:00 AM
Base Vol:      274  212    95   12  274    21   28  161   304   21   33     5
Growth Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   274  212    95   12  274    21   28  161   304   21   33     5
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:    298  230   103   13  298    23   30  175   330   23   36     5
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   298  230   103   13  298    23   30  175   330   23   36     5
PCE Adj:      1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    298  230   103   13  298    23   30  175   330   23   36     5
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:   0.67 0.67  0.67 0.97 0.97  0.97 0.90 0.90  0.90 0.82 0.82  0.85
Lanes:        0.48 0.36  0.16 0.04 0.89  0.07 0.06 0.32  0.62 0.39 0.61  1.00
Final Sat.:    599  463   208   72 1640   126   97  559  1056  603  947  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.50 0.50  0.50 0.18 0.18  0.18 0.31 0.31  0.31 0.04 0.04  0.00
Crit Moves:        ****                              ****
Green/Cycle:  0.55 0.55  0.55 0.55 0.55  0.55 0.40 0.40  0.40 0.40 0.40  0.40
Volume/Cap:   0.90 0.90  0.90 0.33 0.33  0.33 0.78 0.78  0.78 0.09 0.09  0.01
Delay/Veh:    29.5 29.5  29.5  8.8  8.8   8.8 23.9 23.9  23.9 11.2 11.2  10.5
User DelAdj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   29.5 29.5  29.5  8.8  8.8   8.8 23.9 23.9  23.9 11.2 11.2  10.5
DesignQueue:     5    4     2    0    5     0    1    4     8    0    1     0
*******************************************************************************
```

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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #19 Berkeley Way / Oxford Street
********************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.486
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        4.7
Optimal Cycle:       46               Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    20   20    20    20   20    20
Lanes:        1  0  1  1  0    1  0  1  1  0    0  0  1! 0  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      39  717    40    30 1132    11    20   18    72    10    2    12
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   39  717    40    30 1132    11    20   18    72    10    2    12
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89
PHF Volume:    44  806    45    34 1272    12    22   20    81    11    2    13
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   44  806    45    34 1272    12    22   20    81    11    2    13
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    44  806    45    34 1272    12    22   20    81    11    2    13
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.20 0.94  0.94  0.33 0.95  0.95  0.87 0.87  0.87  0.86 0.87  0.87
Lanes:       1.00 1.89  0.11  1.00 1.98  0.02  0.18 0.16  0.66  1.00 0.14  0.86
Final Sat.:   378 3392   189   625 3572    35   302  272  1087  1625  236  1418
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.24  0.24  0.05 0.36  0.36  0.07 0.07  0.07  0.01 0.01  0.01
Crit Moves:                        ****              ****
Green/Cycle: 0.64 0.64  0.64  0.64 0.64  0.64  0.31 0.31  0.31  0.31 0.31  0.31
Volume/Cap:  0.18 0.37  0.37  0.08 0.55  0.55  0.24 0.24  0.24  0.02 0.03  0.03
Delay/Veh:    3.9  3.1   3.1   2.6  4.1   4.1  19.3 19.3  19.3  17.0 17.1  17.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   3.9  3.1   3.1   2.6  4.1   4.1  19.3 19.3  19.3  17.0 17.1  17.1
DesignQueue:    1   12     1     0   19     0     1    1     2     0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #20 University Avenue / Sixth Street
********************************************************************************
Cycle (sec):        114               Critical Vol./Cap. (X):        0.812
Loss Time (sec):     16 (Y+R =  5 sec) Average Delay (sec/veh):       83.6
Optimal Cycle:      114               Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Prot+Permit       Permitted        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     6   23    23     0   23    23     6   15    15     6   15    15
Lanes:        1  0  1  0  1    1  0  1  0  1    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     211  111    19    73  290   325    89  932   333    40  931    21
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  211  111    19    73  290   325    89  932   333    40  931    21
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:   224  118    20    78  309   346    95  991   354    43  990    22
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  224  118    20    78  309   346    95  991   354    43  990    22
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   224  118    20    78  309   346    95  991   354    43  990    22
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 1.00  0.85  0.68 1.00  0.85  0.95 0.91  0.91  0.95 0.95  0.95
Lanes:       1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.47  0.53  1.00 1.96  0.04
Final Sat.:  1805 1900  1615  1286 1900  1615  1805 2556   913  1805 3520    79
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.06  0.01  0.06 0.16  0.21  0.05 0.39  0.39  0.02 0.28  0.28
Crit Moves:  ****                        ****         ****        ****
Green/Cycle: 0.41 0.41  0.41  0.27 0.27  0.27  0.10 0.32  0.32  0.05 0.32  0.32
Volume/Cap:  0.30 0.15  0.03  0.22 0.60  0.79  0.54 1.23  1.23  0.45 0.89  0.89
Delay/Veh:   23.5 21.4  20.0  33.6 41.1  51.8  60.8  150 149.9  66.9 47.8  47.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  23.5 21.4  20.0  33.6 41.1  51.8  60.8  150 149.9  66.9 47.8  47.8
DesignQueue:    9    4     1     4   15    17     5   46    17     3   45     1
********************************************************************************
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LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #21 University Avenue / San Pablo Avenue

Cycle (sec): 114 Critical Vol./Cap. (X): 0.822
Loss Time (sec): 16 (Y+R = 5 sec) Average Delay (sec/veh): 115.4
Optimal Cycle: 97 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	5	21	21	5	21	21	5	22	22	5	22	22
Lanes:	1 0	1 1	0	1 0	1 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM												
Base Vol:	100	457	75	190	837	83	56	957	49	63	644	93
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	100	457	75	190	837	83	56	957	49	63	644	93
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	112	513	84	213	940	93	63	1075	55	71	724	104
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	112	513	84	213	940	93	63	1075	55	71	724	104
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	112	513	84	213	940	93	63	1075	55	71	724	104
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.94	0.94	0.95	0.94	0.94	0.95	0.93	0.93
Lanes:	1.00	1.72	0.28	1.00	1.82	0.18	1.00	1.90	0.10	1.00	1.75	0.25
Final Sat.:	1805	3036	498	1805	3242	321	1805	3410	175	1805	3095	447
Capacity Analysis Module:												
Vol/Sat:	0.06	0.17	0.17	0.12	0.29	0.29	0.03	0.32	0.32	0.04	0.23	0.23
Crit Moves:	****				****			****		****		
Green/Cycle:	0.17	0.31	0.31	0.17	0.31	0.31	0.05	0.22	0.22	0.06	0.22	0.22
Volume/Cap:	0.37	0.55	0.55	0.71	0.95	0.95	0.66	1.44	1.44	0.64	1.07	1.07
Delay/Veh:	45.7	35.0	35.0	58.2	55.4	55.4	84.0	249	248.8	77.2	95.9	95.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.7	35.0	35.0	58.2	55.4	55.4	84.0	249	248.8	77.2	95.9	95.9
DesignQueue:	6	23	4	12	44	4	4	57	3	4	38	5

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #22 University Avenue / Martin Luther King Way

Cycle (sec): 65 Critical Vol./Cap. (X): 0.789
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 20.7
Optimal Cycle: 66 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	5	23	23	23	23	23	17	17	17	17	17	17
Lanes:	1 0	1 1	0	1 0	1 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	178	568	80	57	833	87	81	703	185	41	477	47
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	178	568	80	57	833	87	81	703	185	41	477	47
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	191	611	86	61	896	94	87	756	199	44	513	51
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	191	611	86	61	896	94	87	756	199	44	513	51
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	191	611	86	61	896	94	87	756	199	44	513	51
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.35	0.93	0.93	0.32	0.94	0.94	0.36	0.92	0.92	0.17	0.94	0.94
Lanes:	1.00	1.75	0.25	1.00	1.81	0.19	1.00	1.58	0.42	1.00	1.82	0.18
Final Sat.:	658	3107	438	599	3223	337	676	2769	729	331	3243	320
Capacity Analysis Module:												
Vol/Sat:	0.29	0.20	0.20	0.10	0.28	0.28	0.13	0.27	0.27	0.13	0.16	0.16
Crit Moves:	****				****			****				
Green/Cycle:	0.43	0.43	0.43	0.34	0.34	0.34	0.35	0.35	0.35	0.35	0.35	0.35
Volume/Cap:	0.68	0.46	0.46	0.30	0.82	0.82	0.36	0.77	0.77	0.38	0.45	0.45
Delay/Veh:	25.8	12.3	12.3	18.9	25.1	25.1	19.8	23.4	23.4	24.7	17.3	17.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.8	12.3	12.3	18.9	25.1	25.1	19.8	23.4	23.4	24.7	17.3	17.3
DesignQueue:	6	13	2	1	23	2	2	19	5	1	12	1

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------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
               2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #23 University Avenue / Milvia Street
******************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        0.502
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        10.8
Optimal Cycle:        49              Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   21   21    21   21   21    21   20   20    20   20   20    20
Lanes:       1  0  0  1  0   0  0  1! 0  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     100   98    21    6  203    63   37  656   137   18  406    15
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  100   98    21    6  203    63   37  656   137   18  406    15
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:   109  107    23    7  221    68   40  713   149   20  441    16
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  109  107    23    7  221    68   40  713   149   20  441    16
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   109  107    23    7  221    68   40  713   149   20  441    16
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.69 0.97  0.97 0.97 0.97  0.97 0.85 0.85  0.85 0.86 0.86  0.86
Lanes:       1.00 0.82  0.18 0.02 0.75  0.23 0.09 1.58  0.33 0.08 1.85  0.07
Final Sat.:  1303 1524   327   40 1369   425  144 2559   534  134 3033   112
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.07  0.07 0.16 0.16  0.16 0.28 0.28  0.28 0.15 0.15  0.15
Crit Moves:                       ****             ****
Green/Cycle: 0.38 0.38  0.38 0.38 0.38  0.38 0.56 0.56  0.56 0.56 0.56  0.56
Volume/Cap:  0.22 0.18  0.18 0.42 0.42  0.42 0.50 0.50  0.50 0.26 0.26  0.26
Delay/Veh:   14.4 13.8  13.8 16.5 16.5  16.5  9.6  9.6   9.6  7.7  7.7   7.7
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  14.4 13.8  13.8 16.5 16.5  16.5  9.6  9.6   9.6  7.7  7.7   7.7
DesignQueue:    2    2     1    0    5     2    1   12     2    0    7     0
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------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
               2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #24 University Avenue / SB Shattuck Avenue
******************************************************************************
Cycle (sec):          75              Critical Vol./Cap. (X):        0.459
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        19.7
Optimal Cycle:        40              Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0   16   16    16   16   16    16   16   16    16
Lanes:       0  0  0  0  0   0  1  1  1  0   1  0  1  1  0   0  1  0  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0   49  767   105  115  401   162   26  356   314
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0   49  767   105  115  401   162   26  356   314
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:     0    0     0   52  816   112  122  427   172   28  379   334
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0   52  816   112  122  427   172   28  379   334
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0    0     0   52  816   112  122  427   172   28  379   334
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.79 0.79  0.79 0.45 0.82  0.82 0.72 0.72  0.72
Lanes:       0.00 0.00  0.00 0.16 2.50  0.34 1.00 1.42  0.58 0.11 1.54  1.35
Final Sat.:     0    0     0  240 3757   514  846 2215   895  154 2112  1863
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.22 0.22  0.22 0.14 0.19  0.19 0.18 0.18  0.18
Crit Moves:                       ****             ****
Green/Cycle: 0.00 0.00  0.00 0.36 0.36  0.36 0.30 0.30  0.30 0.30 0.53  0.53
Volume/Cap:  0.00 0.00  0.00 0.60 0.60  0.60 0.48 0.64  0.64 0.60 0.34  0.34
Delay/Veh:    0.0  0.0   0.0 21.3 21.3  21.3 27.9 26.1  26.1 24.5 10.5  10.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 21.3 21.3  21.3 27.9 26.1  26.1 24.5 10.5  10.5
DesignQueue:    0    0     0    1   23     3    4   13     5    1    8     7
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LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #25 University Avenue / NB Shattuck Avenue

Cycle (sec):	75	Critical Vol./Cap. (X):	0.335
Loss Time (sec):	15 (Y+R = 4 sec)	Average Delay (sec/veh):	15.7
Optimal Cycle:	47	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	19	0	19	0	0	0	0	13	0	0	13	0
Lanes:	2 0 1! 0 1			0 0 0 0 0			0 0 2 0 0			0 0 2 0 0		
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	458	0	168	0	0	0	0	444	0	0	235	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	458	0	168	0	0	0	0	444	0	0	235	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	492	0	181	0	0	0	0	477	0	0	253	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	492	0	181	0	0	0	0	477	0	0	253	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	492	0	181	0	0	0	0	477	0	0	253	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.81	1.00	0.83	1.00	1.00	1.00	1.00	0.86	1.00	1.00	0.86	1.00
Lanes:	2.65	0.00	1.35	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00
Final Sat.:	4075	0	2135	0	0	0	0	3249	0	0	3249	0
Capacity Analysis Module:												
Vol/Sat:	0.12	0.00	0.08	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.08	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.36	0.00	0.36	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.44	0.00
Volume/Cap:	0.34	0.00	0.23	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.18	0.00
Delay/Veh:	17.9	0.0	17.0	0.0	0.0	0.0	0.0	14.4	0.0	0.0	13.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	17.9	0.0	17.0	0.0	0.0	0.0	0.0	14.4	0.0	0.0	13.0	0.0
DesignQueue:	13	0	5	0	0	0	0	11	0	0	6	0

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #26 University Avenue / Oxford Street

Cycle (sec):	65	Critical Vol./Cap. (X):	0.800
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	29.0
Optimal Cycle:	68	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	5	18	18	5	18	18	18	18	18	18	18	18
Lanes:	1 0 1 1 0			1 0 1 1 0			1 1 0 0 1			0 0 1! 0 0		
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	147	487	4	41	1101	77	300	38	217	6	12	23
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	147	487	4	41	1101	77	300	38	217	6	12	23
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	162	535	4	45	1210	85	330	42	238	7	13	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	162	535	4	45	1210	85	330	42	238	7	13	25
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	162	535	4	45	1210	85	330	42	238	7	13	25
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.86	0.85	0.85	0.37	0.85	0.85	0.65	0.65	0.77	0.81	0.81	0.81
Lanes:	1.00	1.98	0.02	1.00	1.87	0.13	1.78	0.22	1.00	0.15	0.29	0.56
Final Sat.:	1625	3219	26	710	3006	210	2189	277	1454	225	450	863
Capacity Analysis Module:												
Vol/Sat:	0.10	0.17	0.17	0.06	0.40	0.40	0.15	0.15	0.16	0.03	0.03	0.03
Crit Moves:	****				****				****			
Green/Cycle:	0.41	0.41	0.41	0.41	0.41	0.41	0.30	0.30	0.30	0.30	0.30	0.30
Volume/Cap:	0.24	0.41	0.41	0.16	0.99	0.99	0.50	0.50	0.55	0.10	0.10	0.10
Delay/Veh:	13.5	14.6	14.6	13.3	41.0	41.0	21.2	21.2	23.9	16.8	16.8	16.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	13.5	14.6	14.6	13.3	41.0	41.0	21.2	21.2	23.9	16.8	16.8	16.8
DesignQueue:	4	12	0	1	28	2	9	1	6	0	0	1

```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #27 Univeristy Drive (East Gate)  / Gayley Road
*******************************************************************************
Average Delay (sec/veh):       2.6         Worst Case Level Of Service:       C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    1  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:      69  476     0     0  543    75    53    0    73     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   69  476     0     0  543    75    53    0    73     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    73  501     0     0  572    79    56    0    77     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    73  501     0     0  572    79    56    0    77     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  651 xxxx xxxxx  xxxx xxxx xxxxx  1257 xxxx   611  xxxx xxxx xxxxx
Potent Cap.:  945 xxxx xxxxx  xxxx xxxx xxxxx   191 xxxx   497  xxxx xxxx xxxxx
Move Cap.:    945 xxxx xxxxx  xxxx xxxx xxxxx   179 xxxx   497  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.1 xxxx xxxxx xxxxx xxxx xxxxx  33.9 xxxx  13.6 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     D    *     B     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             22.1            xxxxxx
ApproachLOS:        *                *                 C                *
```



```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #28 Addison Street / Oxford Street
*******************************************************************************
Average Delay (sec/veh):       0.5         Worst Case Level Of Service:       B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  2  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      54  647     0     0 1165    61     4    0    31     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   54  647     0     0 1165    61     4    0    31     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:    59  711     0     0 1280    67     4    0    34     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    59  711     0     0 1280    67     4    0    34     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  812 xxxx xxxxx  xxxx xxxx xxxxx  1392 xxxx     0  xxxx xxxx xxxxx
Potent Cap.:  622 xxxx xxxxx  xxxx xxxx xxxxx   102 xxxx     0  xxxx xxxx xxxxx
Move Cap.:    622 xxxx xxxxx  xxxx xxxx xxxxx    95 xxxx     0  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 11.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  830 xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  9.5 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    A     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx              9.5            xxxxxx
ApproachLOS:        *                *                 A                *
```

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #29 Center Street / SB Shattuck Avenue

Cycle (sec):	65	Critical Vol./Cap. (X):	0.348
Loss Time (sec):	12 (Y+R = 9 sec)	Average Delay (sec/veh):	14.9
Optimal Cycle:	65	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	20	20	20	0	22	22	33	33	0
Lanes:		0 0 0 0 0			0 1 1 1 0			0 0 0 1 0			0 1 0 0 0	
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	0	0	0	15	779	71	0	69	51	17	102	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	15	779	71	0	69	51	17	102	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	0	0	16	838	76	0	74	55	18	110	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	16	838	76	0	74	55	18	110	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	16	838	76	0	74	55	18	110	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.80	0.80	0.80	1.00	0.85	0.85	0.86	0.86	1.00
Lanes:	0.00	0.00	0.00	0.05	2.70	0.25	0.00	0.58	0.42	0.14	0.86	0.00
Final Sat.:	0	0	0	79	4104	374	0	927	685	233	1398	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.20	0.20	0.20	0.00	0.08	0.08	0.08	0.08	0.00
Crit Moves:					****			****				
Green/Cycle:	0.00	0.00	0.00	0.31	0.31	0.31	0.00	0.34	0.34	0.51	0.51	0.00
Volume/Cap:	0.00	0.00	0.00	0.66	0.66	0.66	0.00	0.24	0.24	0.15	0.15	0.00
Delay/Veh:	0.0	0.0	0.0	16.3	16.3	16.3	0.0	16.5	16.5	3.1	3.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	16.3	16.3	16.3	0.0	16.5	16.5	3.1	3.1	0.0
DesignQueue:	0	0	0	0	22	2	0	2	1	0	2	0

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #30 Center Street / NB Shattuck Avenue

Cycle (sec):	65	Critical Vol./Cap. (X):	0.285
Loss Time (sec):	8 (Y+R = 9 sec)	Average Delay (sec/veh):	4.6
Optimal Cycle:	60	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	30	30	30	0	0	0	22	22	0	0	22	22
Lanes:		0 1 1 1 0			0 0 0 0 0			0 1 0 0 0			0 0 0 1 0	
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	42	616	51	0	0	0	26	56	0	0	77	26
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	42	616	51	0	0	0	26	56	0	0	77	26
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
PHF Volume:	48	708	59	0	0	0	30	64	0	0	89	30
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	48	708	59	0	0	0	30	64	0	0	89	30
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	48	708	59	0	0	0	30	64	0	0	89	30
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.80	0.80	0.80	1.00	1.00	1.00	0.80	0.80	1.00	1.00	0.87	0.87
Lanes:	0.18	2.61	0.21	0.00	0.00	0.00	0.32	0.68	0.00	0.00	0.75	0.25
Final Sat.:	270	3967	328	0	0	0	479	1032	0	0	1235	417
Capacity Analysis Module:												
Vol/Sat:	0.18	0.18	0.18	0.00	0.00	0.00	0.06	0.06	0.00	0.00	0.07	0.07
Crit Moves:		****									****	
Green/Cycle:	0.54	0.54	0.54	0.00	0.00	0.00	0.34	0.34	0.00	0.00	0.34	0.34
Volume/Cap:	0.33	0.33	0.33	0.00	0.00	0.00	0.18	0.18	0.00	0.00	0.21	0.21
Delay/Veh:	2.2	2.2	2.2	0.0	0.0	0.0	10.8	10.8	0.0	0.0	16.2	16.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	2.2	2.2	2.2	0.0	0.0	0.0	10.8	10.8	0.0	0.0	16.2	16.2
DesignQueue:	1	12	1	0	0	0	1	2	0	0	2	1

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #31 Center Street / Oxford Street

Cycle (sec): 65 Critical Vol./Cap. (X): 0.516
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 8.3
Optimal Cycle: 46 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	19	19	19	19	19	19	19	19	19	19	19	19
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	50	663	42	11	1145	39	26	10	43	19	6	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	50	663	42	11	1145	39	26	10	43	19	6	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	54	713	45	12	1231	42	28	11	46	20	6	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	54	713	45	12	1231	42	28	11	46	20	6	9
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	54	713	45	12	1231	42	28	11	46	20	6	9
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.18	0.85	0.85	0.32	0.85	0.85	0.77	0.77	0.77	0.76	0.76	0.76
Lanes:	1.00	1.88	0.12	1.00	1.93	0.07	0.33	0.13	0.54	0.58	0.18	0.24
Final Sat.:	340	3028	192	612	3126	106	479	184	793	826	261	348
Capacity Analysis Module:												
Vol/Sat:	0.16	0.24	0.24	0.02	0.39	0.39	0.06	0.06	0.06	0.02	0.02	0.02
Crit Moves:					****			****				
Green/Cycle:	0.63	0.63	0.63	0.63	0.63	0.63	0.31	0.31	0.31	0.31	0.31	0.31
Volume/Cap:	0.25	0.37	0.37	0.03	0.62	0.62	0.19	0.19	0.19	0.08	0.08	0.08
Delay/Veh:	8.0	6.3	6.3	4.7	8.8	8.8	17.5	17.5	17.5	16.3	16.3	16.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.0	6.3	6.3	4.7	8.8	8.8	17.5	17.5	17.5	16.3	16.3	16.3
DesignQueue:	1	10	1	0	18	1	1	0	1	1	0	0

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #32 Stadium Rim Road / Gayley Road

Cycle (sec): 100 Critical Vol./Cap. (X): 0.911
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 26.2
Optimal Cycle: 0 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	1 0	0 1	0	0 0	0 0	1!	0 0	0 0	1!	0 0
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	0	386	19	128	471	0	12	5	14	18	1	118
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	386	19	128	471	0	12	5	14	18	1	118
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	415	20	138	506	0	13	5	15	19	1	127
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	415	20	138	506	0	13	5	15	19	1	127
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	415	20	138	506	0	13	5	15	19	1	127
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.95	0.05	0.21	0.79	0.00	0.39	0.16	0.45	0.13	0.01	0.86
Final Sat.:	0	641	32	151	556	0	190	79	222	74	4	488
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.65	0.65	0.91	0.91	xxxx	0.07	0.07	0.07	0.26	0.26	0.26
Crit Moves:		****			****		****				****	
Delay/Veh:	0.0	16.8	16.8	36.9	36.9	0.0	10.0	10.0	10.0	10.8	10.8	10.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	16.8	16.8	36.9	36.9	0.0	10.0	10.0	10.0	10.8	10.8	10.8
LOS by Move:	*	C	C	E	E	*	A	A	A	B	B	B
ApproachDel:		16.8			36.9			10.0			10.8	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		16.8			36.9			10.0			10.8	
LOS by Appr:		C			E			A			B	

```
--------------------------------------------------------------------------------
                       LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #33 Allston Way / Oxford Street
********************************************************************************
Average Delay (sec/veh):      1.1          Worst Case Level Of Service:       D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  1  0  0    0  1  0  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      17  798     0    59 1111    34    16    0    33     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   17  798     0    59 1111    34    16    0    33     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:    18  858     0    63 1195    37    17    0    35     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    18  858     0    63 1195    37    17    0    35     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1129 xxxx xxxxx   858 xxxx xxxxx  1735 xxxx   480  xxxx xxxx xxxxx
Potent Cap.:  594 xxxx xxxxx   791 xxxx xxxxx    76 xxxx   510  xxxx xxxx xxxxx
Move Cap.:    594 xxxx xxxxx   791 xxxx xxxxx    70 xxxx   510  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 11.3 xxxx xxxxx   9.9 xxxx xxxxx  73.0 xxxx  12.6 xxxxx xxxx xxxxx
LOS by Move:    B    *     *     A    *     *     F    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 11.3 xxxx xxxxx   9.9 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     A    *     *     *    *     *     *    *     *
ApproachDel:      xxxxxx           xxxxxx            32.3           xxxxxx
ApproachLOS:         *                *                D               *
```



```
--------------------------------------------------------------------------------
                       LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #34 Kittridge Street / Oxford Street / Fulton Street
********************************************************************************
Average Delay (sec/veh):      0.4          Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      13  801     0     0 1122    18     6    0    23     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   13  801     0     0 1122    18     6    0    23     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:    14  861     0     0 1206    19     6    0    25     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    14  861     0     0 1206    19     6    0    25     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1079 xxxx xxxxx  xxxx xxxx xxxxx  1565 xxxx   418  xxxx xxxx xxxxx
Potent Cap.:  607 xxxx xxxxx  xxxx xxxx xxxxx    97 xxxx   547  xxxx xxxx xxxxx
Move Cap.:    607 xxxx xxxxx  xxxx xxxx xxxxx    95 xxxx   547  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 11.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  276 xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 11.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx 19.7 xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:      xxxxxx           xxxxxx            19.7           xxxxxx
ApproachLOS:         *                *                C               *
```

```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Base Volume Alternative)
*******************************************************************************
Intersection #35 Stadium Rim Road / Centennial Drive
*******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.325
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       9.2
Optimal Cycle:        0              Level Of Service:                  A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:            Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  0  0  0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0   70  160    94   22    0     0    0    0   114    0   71
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0   70  160    94   22    0     0    0    0   114    0   71
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.85 0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85
PHF Volume:     0   82  188   111   26    0     0    0    0   134    0   84
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0   82  188   111   26    0     0    0    0   134    0   84
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:     0   82  188   111   26    0     0    0    0   134    0   84
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.00 0.30 0.70  0.81 0.19 0.00  0.00 0.00 0.00  0.61 0.01 0.38
Final Sat.:     0  253  579   575  135    0     0    0    0   452    0  282
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.33 0.33  0.19 0.19 xxxx  xxxx xxxx xxxx  0.30 0.00 0.30
Crit Moves:            ****       ****                       ****
Delay/Veh:    0.0  9.0  9.0   8.9  8.9  0.0   0.0  0.0  0.0   9.5  9.5  9.5
Delay Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   0.0  9.0  9.0   8.9  8.9  0.0   0.0  0.0  0.0   9.5  9.5  9.5
LOS by Move:    *    A    A     A    A    *     *    *    *     A    A    A
ApproachDel:       9.0              8.9            xxxxxx             9.5
Delay Adj:        1.00             1.00             xxxxx            1.00
ApprAdjDel:        9.0              8.9            xxxxxx             9.5
LOS by Appr:         A                A                 *               A
*******************************************************************************
```



```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #36 Bancroft Way / Shattuck Avenue
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.457
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       8.6
Optimal Cycle:       42              Level Of Service:                  A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:            Include          Include          Include          Include
Min. Green:    18   18    0     0   18   18     0    0    0    16   16   16
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      29  912    0     0  788   12     1    0   62   116   51   71
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   29  912    0     0  788   12     1    0   62   116   51   71
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93
PHF Volume:    31  981    0     0  847   13     1    0   67   125   55   76
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   31  981    0     0  847   13     1    0   67   125   55   76
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:    31  981    0     0  847   13     1    0   67   125   55   76
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.29 0.86 1.00  1.00 0.85 0.85  0.78 1.00 0.78  0.67 0.82 0.82
Lanes:       1.00 2.00 0.00  0.00 1.97 0.03  0.02 0.00 0.98  1.00 0.42 0.58
Final Sat.:   559 3249    0     0 3194   49    24    0 1459  1264  653  909
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.30 0.00  0.00 0.27 0.27  0.05 0.00 0.05  0.10 0.08 0.08
Crit Moves:       ****                                       ****
Green/Cycle: 0.62 0.62 0.00  0.00 0.62 0.62  0.00 0.00 0.00  0.30 0.30 0.30
Volume/Cap:  0.09 0.49 0.00  0.00 0.43 0.43  xxxx 0.00 xxxx  0.33 0.28 0.28
Delay/Veh:    5.6  7.7  0.0   0.0  7.2  7.2   0.0  0.0  0.0  20.0 18.9 18.9
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   5.6  7.7  0.0   0.0  7.2  7.2   0.0  0.0  0.0  20.0 18.9 18.9
DesignQueue:    0   14    0     0   12    0     0    0    2     3    1    2
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #37 Bancroft Way / Fulton Street
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.394
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        6.3
Optimal Cycle:       49              Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Ignore
Min. Green:    17   17     0     0   17    17     0    0     0    24   24    24
Lanes:        0  1  1  0  0   0  0  2  1  0   0  0  0  0  0   0  1  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      13  146     0     0 1071    79     0    0     0    84  173   650
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   13  146     0     0 1071    79     0    0     0    84  173   650
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
PHF Adj:     0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.00
PHF Volume:    15  164     0     0 1203    89     0    0     0    94  194     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   15  164     0     0 1203    89     0    0     0    94  194     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
Final Vol.:    15  164     0     0 1203    89     0    0     0    94  194     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.82 0.82  1.00  1.00 0.90  0.90  1.00 1.00  1.00  0.81 0.81  1.00
Lanes:       0.16 1.84  0.00  0.00 2.79  0.21  0.00 0.00  0.00  0.65 1.35  1.00
Final Sat.:   256 2877     0     0 4782   353     0    0     0  1003 2066  1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.06  0.00  0.00 0.25  0.25  0.00 0.00  0.00  0.09 0.09  0.00
Crit Moves:                        ****                              ****
Green/Cycle: 0.60 0.60  0.00  0.00 0.60  0.60  0.00 0.00  0.00  0.34 0.34  0.34
Volume/Cap:  0.10 0.10  0.00  0.00 0.42  0.42  0.00 0.00  0.00  0.28 0.28  0.00
Delay/Veh:    3.3  3.3   0.0   0.0  4.4   4.4   0.0  0.0   0.0  16.4 16.4   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   3.3  3.3   0.0   0.0  4.4   4.4   0.0  0.0   0.0  16.4 16.4   0.0
DesignQueue:    0    2     0     0   18     1     0    0     0     2    5     0
********************************************************************************
```



```
--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #38 Bancroft Way / Ellsworth Street
********************************************************************************
Average Delay (sec/veh):     4.9          Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        1  1  0  0  0   0  0  0  0  1   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     241   60     0     0    0    11     0    0     0     0  674    39
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  241   60     0     0    0    11     0    0     0     0  674    39
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:   265   66     0     0    0    12     0    0     0     0  741    43
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   265   66     0     0    0    12     0    0     0     0  741    43
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  370  784 xxxxx  xxxx xxxx   392  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  590  328 xxxxx  xxxx xxxx   661  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    579  328 xxxxx  xxxx xxxx   661  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 13.0 xxxx xxxxx xxxxx xxxx  10.5 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     *    *     B     *    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.:  461 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 18.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     C    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:      16.4             10.5            xxxxxx           xxxxxx
ApproachLOS:        C                B                *                *
```

```
-------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #39 Bancroft Way / Dana Street
*******************************************************************************
Average Delay (sec/veh):      0.0          Worst Case Level Of Service:       A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  1  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0     0    0     0     0    0     0   145  721     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0    0     0     0    0     0   145  721     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0    0     0     0    0     0     0    0     0   154  767     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0     0    0     0     0    0     0   154  767     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        *                *                *                *
```



```
-------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #40 Bancroft Way / Telegraph Avenue
*******************************************************************************
Cycle (sec):         65                Critical Vol./Cap. (X):        0.258
Loss Time (sec):      8 (Y+R = 23 sec) Average Delay (sec/veh):        20.4
Optimal Cycle:       46                Level Of Service:                  C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    15    0     0     0    0     0     0    0     0     0   23     0
Lanes:       2  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     427    0     0     0    0     0     0    0     0     0  460     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  427    0     0     0    0     0     0    0     0     0  460     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:   459    0     0     0    0     0     0    0     0     0  495     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  459    0     0     0    0     0     0    0     0     0  495     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   459    0     0     0    0     0     0    0     0     0  495     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.91  1.00
Lanes:       2.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 3.00  0.00
Final Sat.:  3502    0     0     0    0     0     0    0     0     0 5187     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.10  0.00
Crit Moves:  ****                                                    ****
Green/Cycle: 0.23 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.35  0.00
Volume/Cap:  0.57 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.27  0.00
Delay/Veh:   25.8  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 15.4   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  25.8  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 15.4   0.0
DesignQueue:   13    0     0     0    0     0     0    0     0     0   12     0
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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #41 Bancroft Way / Bowditch Street
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.456
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       11.5
Optimal Cycle:        0              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     191    0    0    0    0    0    0    0    0   99  494    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  191    0    0    0    0    0    0    0    0   99  494    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume:   201    0    0    0    0    0    0    0    0  104  520    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  201    0    0    0    0    0    0    0    0  104  520    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   201    0    0    0    0    0    0    0    0  104  520    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.33 1.67 0.00
Final Sat.:   650    0    0    0    0    0    0    0    0  229 1163    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.31 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.46 0.45 xxxx
Crit Moves:  ****                                         ****
Delay/Veh:   10.6  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 12.1 11.8  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  10.6  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 12.1 11.8  0.0
LOS by Move:    B    *    *    *    *    *    *    *    *    B    B    *
ApproachDel:       10.6           xxxxxx           xxxxxx           11.8
Delay Adj:         1.00            xxxxx            xxxxx           1.00
ApprAdjDel:        10.6           xxxxxx           xxxxxx           11.8
LOS by Appr:         B                *                *               B
********************************************************************************
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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #42 Bancroft Way / College Avenue
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.547
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       11.8
Optimal Cycle:        0              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     343    0    0    0    0    0    0    0    0   34  203    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  343    0    0    0    0    0    0    0    0   34  203    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85
PHF Volume:   404    0    0    0    0    0    0    0    0   40  239    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  404    0    0    0    0    0    0    0    0   40  239    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   404    0    0    0    0    0    0    0    0   40  239    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.29 1.71 0.00
Final Sat.:   738    0    0    0    0    0    0    0    0  177 1073    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.55 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.23 0.22 xxxx
Crit Moves:  ****                                         ****
Delay/Veh:   13.2  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  9.9  9.7  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  13.2  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  9.9  9.7  0.0
LOS by Move:    B    *    *    *    *    *    *    *    *    A    A    *
ApproachDel:       13.2           xxxxxx           xxxxxx            9.7
Delay Adj:         1.00            xxxxx            xxxxx           1.00
ApprAdjDel:        13.2           xxxxxx           xxxxxx            9.7
LOS by Appr:         B                *                *               A
********************************************************************************
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LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #43 Bancroft Way / Piedmont Avenue

Cycle (sec): 100 Critical Vol./Cap. (X): 0.930
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 28.2
Optimal Cycle: 0 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Stop Sign			Stop Sign			Stop Sign			Stop Sign	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		0 1 0 0 0			0 0 0 1 0			0 0 0 0 0			0 0 0 0 0	
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	131	553	0	0	344	123	0	0	0	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	131	553	0	0	344	123	0	0	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	144	608	0	0	378	135	0	0	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	144	608	0	0	378	135	0	0	0	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	144	608	0	0	378	135	0	0	0	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.19	0.81	0.00	0.00	0.74	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Final Sat.:	155	654	0	0	587	210	0	0	0	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.93	0.93	xxxx	xxxx	0.64	0.64	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Crit Moves:		****			****							
Delay/Veh:	37.2	37.2	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.2	37.2	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
LOS by Move:	E	E	*	*	C	C	*	*	*	*	*	*
ApproachDel:		37.2			15.0			xxxxxx			xxxxxx	
Delay Adj:		1.00			1.00			xxxxx			xxxxx	
ApprAdjDel:		37.2			15.0			xxxxxx			xxxxxx	
LOS by Appr:		E			C			*			*	

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #44 Durant Avenue / Shattuck Avenue

Cycle (sec): 65 Critical Vol./Cap. (X): 0.472
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 11.3
Optimal Cycle: 53 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Prot+Permit			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	19	19	19	5	19	19	17	17	17	0	0	0
Lanes:		1 0 1 1 0			1 0 1 1 0			0 1 0 1 0			0 0 0 0 0	
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	55	943	136	67	886	8	9	70	35	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	55	943	136	67	886	8	9	70	35	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	58	993	143	71	933	8	9	74	37	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	58	993	143	71	933	8	9	74	37	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	58	993	143	71	933	8	9	74	37	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Lanes:	1.00	1.75	0.25	1.00	1.98	0.02	0.16	1.23	0.61	0.00	0.00	0.00
Final Sat.:	1900	3155	455	1900	3578	32	285	2217	1108	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.03	0.31	0.31	0.04	0.26	0.26	0.03	0.03	0.03	0.00	0.00	0.00
Crit Moves:		****		****				****				
Green/Cycle:	0.37	0.37	0.37	0.55	0.55	0.55	0.27	0.27	0.27	0.00	0.00	0.00
Volume/Cap:	0.08	0.85	0.85	0.07	0.48	0.48	0.12	0.12	0.12	0.00	0.00	0.00
Delay/Veh:	8.4	18.5	18.5	1.5	2.6	2.6	18.2	18.2	18.2	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.4	18.5	18.5	1.5	2.6	2.6	18.2	18.2	18.2	0.0	0.0	0.0
DesignQueue:	1	24	3	1	16	0	0	2	1	0	0	0

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                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #45 Durant Avenue / Fulton Street
********************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):        0.352
Loss Time (sec):       8 (Y+R =  3 sec) Average Delay (sec/veh):        7.3
Optimal Cycle:        51               Level Of Service:                A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0   21   21    0   22   22   22    0    0    0
Lanes:        0  0  0  0  0   1  1  1  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0    0  459  656    0  123  262   27    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:    0    0    0  459  656    0  123  262   27    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93
PHF Volume:     0    0    0  494  705    0  132  282   29    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:    0    0    0  494  705    0  132  282   29    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:     0    0    0  494  705    0  132  282   29    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  1.00 1.00 1.00 0.95 0.95 1.00 0.99 0.94 0.94 1.00 1.00 1.00
Lanes:       0.00 0.00 0.00 1.23 1.77 0.00 1.00 1.81 0.19 0.00 0.00 0.00
Final Sat.:     0    0    0 2229 3186    0 1873 3227  333    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00 0.22 0.22 0.00 0.07 0.09 0.09 0.00 0.00 0.00
Crit Moves:                      ****           ****
Green/Cycle: 0.00 0.00 0.00 0.60 0.60 0.00 0.35 0.35 0.35 0.00 0.00 0.00
Volume/Cap:  0.00 0.00 0.00 0.37 0.37 0.00 0.20 0.25 0.25 0.00 0.00 0.00
Delay/Veh:    0.0  0.0  0.0  4.2  4.2  0.0 15.7 15.7 15.7  0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:   0.0  0.0  0.0  4.2  4.2  0.0 15.7 15.7 15.7  0.0  0.0  0.0
DesignQueue:    0    0    0    7   11    0    3    7    1    0    0    0
********************************************************************************
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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #46 Durant Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):        0.257
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       10.7
Optimal Cycle:        43               Level Of Service:                B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0   18   18    0    0    0   17   17    0    0    0    0
Lanes:        0  0  1  1  0   0  0  0  0  0   0  1  2  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0  362   86    0    0    0   73  387    0    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:    0  362   86    0    0    0   73  387    0    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96
PHF Volume:     0  377   90    0    0    0   76  403    0    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:    0  377   90    0    0    0   76  403    0    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:     0  377   90    0    0    0   76  403    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  1.00 0.92 0.92 1.00 1.00 1.00 0.91 0.91 1.00 1.00 1.00 1.00
Lanes:       0.00 1.62 0.38 0.00 0.00 0.00 0.48 2.52 0.00 0.00 0.00 0.00
Final Sat.:     0 2832  673    0    0    0  823 4364    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.13 0.13 0.00 0.00 0.00 0.09 0.09 0.00 0.00 0.00 0.00
Crit Moves:       ****                           ****
Green/Cycle: 0.00 0.65 0.65 0.00 0.00 0.00 0.28 0.28 0.00 0.00 0.00 0.00
Volume/Cap:  0.00 0.20 0.20 0.00 0.00 0.00 0.32 0.32 0.00 0.00 0.00 0.00
Delay/Veh:    0.0  2.2  2.2  0.0  0.0  0.0 18.9 18.9  0.0  0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:   0.0  2.2  2.2  0.0  0.0  0.0 18.9 18.9  0.0  0.0  0.0  0.0
DesignQueue:    0    5    1    0    0    0    2   11    0    0    0    0
********************************************************************************
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LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #47 Durant Avenue / College Avenue

Cycle (sec):	65	Critical Vol./Cap. (X):	0.314
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	9.2
Optimal Cycle:	42	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	18	18	0	0	0	16	16	16	0	0	0
Lanes:	0 0 0 1 0			0 1 0 0 0			1 0 1 1 0			0 0 0 0 0		

Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM

Base Vol:	0	213	66	13	23	0	64	228	87	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	213	66	13	23	0	64	228	87	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	0	242	75	15	26	0	73	259	99	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	242	75	15	26	0	73	259	99	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	242	75	15	26	0	73	259	99	0	0	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.97	0.97	1.00	1.00	1.00	0.96	0.91	0.91	1.00	1.00	1.00
Lanes:	0.00	0.76	0.24	0.36	0.64	0.00	1.00	1.45	0.55	0.00	0.00	0.00
Final Sat.:	0	1404	435	686	1214	0	1822	2506	956	0	0	0

Capacity Analysis Module:

Vol/Sat:	0.00	0.17	0.17	0.02	0.02	0.00	0.04	0.10	0.10	0.00	0.00	0.00
Crit Moves:		****						****				
Green/Cycle:	0.00	0.52	0.52	0.52	0.52	0.00	0.43	0.43	0.43	0.00	0.00	0.00
Volume/Cap:	0.00	0.33	0.33	0.04	0.04	0.00	0.09	0.24	0.24	0.00	0.00	0.00
Delay/Veh:	0.0	7.6	7.6	7.7	7.7	0.0	9.9	10.7	10.7	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	7.6	7.6	7.7	7.7	0.0	9.9	10.7	10.7	0.0	0.0	0.0
DesignQueue:	0	4	1	0	0	0	2	5	2	0	0	0

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #48 Durant Avenue / Piedmont Avenue

Cycle (sec):	100	Critical Vol./Cap. (X):	0.761
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	17.4
Optimal Cycle:	0	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1 0 0			0 0 1 0 0			1 0 0 0 1			0 0 0 0 0		

Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM

Base Vol:	0	489	0	0	345	0	158	0	86	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	489	0	0	345	0	158	0	86	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	0	520	0	0	367	0	168	0	91	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	520	0	0	367	0	168	0	91	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	520	0	0	367	0	168	0	91	0	0	0

Saturation Flow Module:

Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	683	0	0	652	0	485	0	576	0	0	0

Capacity Analysis Module:

Vol/Sat:	xxxx	0.76	xxxx	xxxx	0.56	xxxx	0.35	xxxx	0.16	xxxx	xxxx	xxxx
Crit Moves:		****			****		****					
Delay/Veh:	0.0	22.1	0.0	0.0	14.7	0.0	13.1	0.0	9.5	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	22.1	0.0	0.0	14.7	0.0	13.1	0.0	9.5	0.0	0.0	0.0
LOS by Move:	*	C	*	*	B	*	B	*	A	*	*	*
ApproachDel:		22.1			14.7			11.9			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		22.1			14.7			11.9			xxxxxx	
LOS by Appr:		C			B			B			*	

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--------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #49 Channing Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.489
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        4.8
Optimal Cycle:       46              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16    16   16    16    22   22    22    22   22    22
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      42 1070    96    19  868    19    12   59    42    62   28    39
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   42 1070    96    19  868    19    12   59    42    62   28    39
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    44 1115   100    20  904    20    13   61    44    65   29    41
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   44 1115   100    20  904    20    13   61    44    65   29    41
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    44 1115   100    20  904    20    13   61    44    65   29    41
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.31 0.94  0.94  0.21 0.95  0.95  0.93 0.93  0.93  0.80 0.80  0.80
Lanes:       1.00 1.84  0.16  1.00 1.96  0.04  0.11 0.52  0.37  0.48 0.22  0.30
Final Sat.:   587 3273   294   407 3522    77   187  918   653   731  330   460
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.34  0.34  0.05 0.26  0.26  0.07 0.07  0.07  0.09 0.09  0.09
Crit Moves:       ****                                                ****
Green/Cycle: 0.53 0.53  0.53  0.53 0.53  0.53  0.42 0.42  0.42  0.42 0.42  0.42
Volume/Cap:  0.14 0.64  0.64  0.09 0.48  0.48  0.16 0.16  0.16  0.21 0.21  0.21
Delay/Veh:    2.8  4.4   4.4   2.7  3.2   3.2  12.4 12.4  12.4  13.0 13.0  13.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   2.8  4.4   4.4   2.7  3.2   3.2  12.4 12.4  12.4  13.0 13.0  13.0
DesignQueue:    1   20     2     0   16     0     0    1     1     1    1     1
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--------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #50 Channing Way / Fulton Street
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.528
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       12.3
Optimal Cycle:        0              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  0  0  0   0  1  0  1  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0    86  543    51     0  132    20     7   72     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    86  543    51     0  132    20     7   72     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0    0     0    91  572    54     0  139    21     7   76     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0    91  572    54     0  139    21     7   76     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    0     0    91  572    54     0  139    21     7   76     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 0.00  0.00  0.25 1.60  0.15  0.00 0.87  0.13  0.09 0.91  0.00
Final Sat.:     0    0     0   171 1108   106     0  559    85    54  560     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx  0.53 0.52  0.51  xxxx 0.25  0.25  0.14 0.14  xxxx
Crit Moves:                   ****                        ****        ****
Delay/Veh:    0.0  0.0   0.0  13.6 13.1  12.7   0.0 10.0  10.0   9.4  9.4   0.0
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  13.6 13.1  12.7   0.0 10.0  10.0   9.4  9.4   0.0
LOS by Move:    *    *     *     B    B     B     *    B     B     A    A     *
ApproachDel:     xxxxxx            13.1             10.0              9.4
Delay Adj:        xxxxx            1.00             1.00             1.00
ApprAdjDel:      xxxxxx            13.1             10.0              9.4
LOS by Appr:        *                B                B                A
********************************************************************************
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-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #51 Channing Way / Telegraph Avenue
*******************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        0.338
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       9.0
Optimal Cycle:        43              Level Of Service:                 A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    0    0     0   17   17     0    0   17    17
Lanes:        0  1  0  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00-9:00 AM (WB thru adjusted due
Base Vol:      56  423    79    0    0     0   16  179     0    0   98     9
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   56  423    79    0    0     0   16  179     0    0   98     9
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:    62  470    88    0    0     0   18  199     0    0  109    10
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   62  470    88    0    0     0   18  199     0    0  109    10
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    62  470    88    0    0     0   18  199     0    0  109    10
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.91 0.91  0.91 1.00 1.00  1.00 0.98 0.98  1.00 1.00 0.99  0.99
Lanes:       0.20 1.52  0.28 0.00 0.00  0.00 0.08 0.92  0.00 0.00 0.92  0.08
Final Sat.:   347 2623   490    0    0     0  152 1702     0    0 1721   158
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.18  0.18 0.00 0.00  0.00 0.12 0.12  0.00 0.00 0.06  0.06
Crit Moves:       ****                            ****
Green/Cycle: 0.55 0.55  0.55 0.00 0.00  0.00 0.35 0.35  0.00 0.00 0.35  0.35
Volume/Cap:  0.33 0.33  0.33 0.00 0.00  0.00 0.33 0.33  0.00 0.00 0.18  0.18
Delay/Veh:    5.6  5.6   5.6  0.0  0.0   0.0 15.9 15.9   0.0  0.0 14.8  14.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   5.6  5.6   5.6  0.0  0.0   0.0 15.9 15.9   0.0  0.0 14.8  14.8
DesignQueue:    1    8     1    0    0     0    0    5     0    0    3     0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #52 Channing Way / College Avenue
*******************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        0.474
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):      16.2
Optimal Cycle:        43              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18   18   18    18    0    0     0   17   17    17
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM (WB thru, NB righ
Base Vol:      26  256    22    6   92     2   21   76    31   88  150    43
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   26  256    22    6   92     2   21   76    31   88  150    43
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.85
PHF Volume:    31  301    26    7  108     2   25   89    36  104  176    51
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   31  301    26    7  108     2   25   89    36  104  176    51
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    31  301    26    7  108     2   25   89    36  104  176    51
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.96 0.96  0.96 0.98 0.98  0.98 0.97 0.97  0.97 0.79 0.79  0.79
Lanes:       0.09 0.84  0.07 0.06 0.92  0.02 0.16 0.60  0.24 0.31 0.54  0.15
Final Sat.:   157 1543   133  112 1713    37  301 1091   445  470  801   230
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.20 0.20  0.20 0.06 0.06  0.06 0.08 0.08  0.08 0.22 0.22  0.22
Crit Moves:       ****                                              ****
Green/Cycle: 0.65 0.65  0.65 0.65 0.65  0.65 0.28 0.28  0.28 0.28 0.28  0.28
Volume/Cap:  0.30 0.30  0.30 0.10 0.10  0.10 0.29 0.29  0.29 0.77 0.77  0.77
Delay/Veh:    2.8  2.8   2.8  2.0  2.0   2.0 19.5 19.5  19.5 34.1 34.1  34.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   2.8  2.8   2.8  2.0  2.0   2.0 19.5 19.5  19.5 34.1 34.1  34.1
DesignQueue:    0    4     0    0    1     0    1    2     1    3    5     1
*******************************************************************************
```

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #53 Haste Street / Shattuck Avenue

Cycle (sec): 65 Critical Vol./Cap. (X): 0.563
Loss Time (sec): 8 (Y+R = 6 sec) Average Delay (sec/veh): 50.9
Optimal Cycle: 47 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	21	21	0	0	21	21	0	0	0	18	18	18
Lanes:	1 0 2 0 0			0 0 1 1 0			0 0 0 0 0			0 1 0 1 0		
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	66	1117	0	0	903	46	0	0	0	185	276	75
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	66	1117	0	0	903	46	0	0	0	185	276	75
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	70	1188	0	0	961	49	0	0	0	197	294	80
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	70	1188	0	0	961	49	0	0	0	197	294	80
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	70	1188	0	0	961	49	0	0	0	197	294	80
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.21	0.95	1.00	1.00	0.94	0.94	1.00	1.00	1.00	0.91	0.91	0.91
Lanes:	1.00	2.00	0.00	0.00	1.90	0.10	0.00	0.00	0.00	0.69	1.03	0.28
Final Sat.:	401	3610	0	0	3411	174	0	0	0	1194	1782	484
Capacity Analysis Module:												
Vol/Sat:	0.18	0.33	0.00	0.00	0.28	0.28	0.00	0.00	0.00	0.16	0.16	0.16
Crit Moves:		****									****	
Green/Cycle:	0.29	0.29	0.00	0.00	0.29	0.29	0.00	0.00	0.00	0.65	0.65	0.65
Volume/Cap:	0.60	1.13	0.00	0.00	0.96	0.96	0.00	0.00	0.00	0.25	0.25	0.25
Delay/Veh:	34.9	85.9	0.0	0.0	36.7	36.7	0.0	0.0	0.0	4.9	4.9	4.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.9	85.9	0.0	0.0	36.7	36.7	0.0	0.0	0.0	4.9	4.9	4.9
DesignQueue:	2	33	0	0	26	1	0	0	0	3	4	1

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #54 Haste Street / Fulton Street

Cycle (sec): 80 Critical Vol./Cap. (X): 0.340
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 13.8
Optimal Cycle: 53 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	25	25	0	0	0	20	20	0
Lanes:	0 0 0 0 0			0 0 1 1 0			0 0 0 0 0			0 1 1 0 0		
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	0	0	0	0	433	145	0	0	0	23	380	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	433	145	0	0	0	23	380	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	0	0	0	0	476	159	0	0	0	25	418	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	476	159	0	0	0	25	418	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	476	159	0	0	0	25	418	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	0.00	0.00	1.50	0.50	0.00	0.00	0.00	0.11	1.89	0.00
Final Sat.:	0	0	0	0	2602	871	0	0	0	206	3404	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.18	0.18	0.00	0.00	0.00	0.12	0.12	0.00
Crit Moves:					****						****	
Green/Cycle:	0.00	0.00	0.00	0.00	0.69	0.69	0.00	0.00	0.00	0.26	0.26	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.27	0.27	0.00	0.00	0.00	0.47	0.47	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	5.1	5.1	0.0	0.0	0.0	26.5	26.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	5.1	5.1	0.0	0.0	0.0	26.5	26.5	0.0
DesignQueue:	0	0	0	0	7	2	0	0	0	1	14	0

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------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #55 Haste Street / Telegraph Avenue
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.381
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       15.9
Optimal Cycle:       40              Level Of Service:                 B
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    16   16    0    0    0    0    0    0    0    0   16   16
Lanes:        0  1  1  0  0   0  0  0  0  0   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      216  520    0    0    0    0    0    0    0    0  334   34
Growth Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   216  520    0    0    0    0    0    0    0    0  334   34
User Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:      0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92
PHF Volume:    235  565    0    0    0    0    0    0    0    0  363   37
Reduct Vol:      0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   235  565    0    0    0    0    0    0    0    0  363   37
PCE Adj:      1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:      1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    235  565    0    0    0    0    0    0    0    0  363   37
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:   0.95 0.95 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.94 0.94
Lanes:        0.59 1.41 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 1.82 0.18
Final Sat.:   1059 2551    0    0    0    0    0    0    0    0 3231  329
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.22 0.22 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.11 0.11
Crit Moves:        ****                                            ****
Green/Cycle:  0.34 0.34 0.34 0.00 0.00 0.00 0.00 0.00 0.00 0.53 0.53 0.53
Volume/Cap:   0.65 0.65 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.21 0.21
Delay/Veh:    19.7 19.7  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  8.2  8.2
User DelAdj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:   19.7 19.7  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  8.2  8.2
DesignQueue:     6   14    0    0    0    0    0    0    0    0    6    1
******************************************************************************
```



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------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #56 Haste Street / College Avenue
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.467
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        8.3
Optimal Cycle:       40              Level Of Service:                 A
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    16   16    0    0   16   16    0    0    0   16   16   16
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      167  267    0    0  115   69    0    0    0   48  223   21
Growth Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   167  267    0    0  115   69    0    0    0   48  223   21
User Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:      0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90
PHF Volume:    186  297    0    0  128   77    0    0    0   53  248   23
Reduct Vol:      0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   186  297    0    0  128   77    0    0    0   53  248   23
PCE Adj:      1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:      1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    186  297    0    0  128   77    0    0    0   53  248   23
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:   0.80 0.80 1.00 1.00 0.95 0.95 1.00 1.00 1.00 0.93 0.93 0.93
Lanes:        0.38 0.62 0.00 0.00 0.62 0.38 0.00 0.00 0.00 0.33 1.53 0.14
Final Sat.:    585  935    0    0 1127  676    0    0    0  580 2697  254
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.32 0.32 0.00 0.00 0.11 0.11 0.00 0.00 0.00 0.09 0.09 0.09
Crit Moves:        ****                                            ****
Green/Cycle:  0.68 0.68 0.00 0.00 0.68 0.68 0.00 0.00 0.00 0.27 0.27 0.27
Volume/Cap:   0.47 0.47 0.00 0.00 0.17 0.17 0.00 0.00 0.00 0.34 0.34 0.34
Delay/Veh:     3.3  3.3  0.0  0.0  1.6  1.6  0.0  0.0  0.0 20.1 20.1 20.1
User DelAdj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:    3.3  3.3  0.0  0.0  1.6  1.6  0.0  0.0  0.0 20.1 20.1 20.1
DesignQueue:     2    4    0    0    2    1    0    0    0    1    7    1
******************************************************************************
```

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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #57 Dwight Way / Martin Luther King Way
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.716
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       14.2
Optimal Cycle:       56              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    21   21    21     0    0     0
Lanes:       0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:      62  690    66    88  868   163    68  419    83     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   62  690    66    88  868   163    68  419    83     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    65  726    69    93  914   172    72  441    87     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   65  726    69    93  914   172    72  441    87     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    65  726    69    93  914   172    72  441    87     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.72 0.72  0.72  0.74 0.74  0.74  0.91 0.91  0.91  1.00 1.00  1.00
Lanes:       0.15 1.69  0.16  0.16 1.55  0.29  0.24 1.47  0.29  0.00 0.00  0.00
Final Sat.:   207 2308   221   221 2177   409   412 2538   503     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.31 0.31  0.31  0.42 0.42  0.42  0.17 0.17  0.17  0.00 0.00  0.00
Crit Moves:                        ****             ****
Green/Cycle: 0.44 0.44  0.44  0.59 0.59  0.59  0.34 0.34  0.34  0.00 0.00  0.00
Volume/Cap:  0.71 0.71  0.71  0.72 0.72  0.72  0.52 0.52  0.52  0.00 0.00  0.00
Delay/Veh:   17.0 17.0  17.0   9.0  9.0   9.0  20.3 20.3  20.3   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  17.0 17.0  17.0   9.0  9.0   9.0  20.3 20.3  20.3   0.0  0.0   0.0
DesignQueue:    1   17     2     2   16     3     2   12     2     0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #58 Dwight Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.740
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       10.3
Optimal Cycle:       66              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted       Prot+Permit       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0   17    17    20   20     0    17   17    17     0    0     0
Lanes:       0  0  1  1  0    1  0  1  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0 1094   113    95  989     0    66  420   151     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1094   113    95  989     0    66  420   151     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:     0 1140   118    99 1030     0    69  438   157     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1140   118    99 1030     0    69  438   157     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1140   118    99 1030     0    69  438   157     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  0.95 0.95  0.95  0.88 0.88  0.88  1.00 1.00  1.00
Lanes:       0.00 1.81  0.19  1.00 2.00  0.00  0.21 1.32  0.47  0.00 0.00  0.00
Final Sat.:     0 3226   333  1805 3610     0   348 2212   795     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.35  0.35  0.05 0.29  0.00  0.20 0.20  0.20  0.00 0.00  0.00
Crit Moves:       ****        ****                  ****
Green/Cycle: 0.00 0.47  0.47  0.65 0.65  0.00  0.26 0.26  0.26  0.00 0.00  0.00
Volume/Cap:  0.00 0.75  0.75  0.08 0.44  0.00  0.76 0.76  0.76  0.00 0.00  0.00
Delay/Veh:    0.0  9.1   9.1   4.3  0.6   0.0  28.5 28.5  28.5   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  9.1   9.1   4.3  0.6   0.0  28.5 28.5  28.5   0.0  0.0   0.0
DesignQueue:    0   24     2     1   14     0     2   12     4     0    0     0
********************************************************************************
```

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-------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #59 Dwight Way / Fulton Street
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.432
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       11.3
Optimal Cycle:       45              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0    21    21     0     0     0    16    16     0     0     0
Lanes:       0  0  0  0  1   2  0  0  0  0   0  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0     0    12   449     0     0     0   620     6     0     0     0
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   0     0    12   449     0     0     0   620     6     0     0     0
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97  0.97
PHF Volume:    0     0    12   463     0     0     0   639     6     0     0     0
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   0     0    12   463     0     0     0   639     6     0     0     0
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Final Vol.:    0     0    12   463     0     0     0   639     6     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  1.00  1.00  0.87  0.60  1.00  1.00  1.00  0.95  0.95  1.00  1.00  1.00
Lanes:       0.00  0.00  1.00  2.00  0.00  0.00  0.00  1.98  0.02  0.00  0.00  0.00
Final Sat.:    0     0  1644  2274     0     0     0  3572    35     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.01  0.20  0.00  0.00  0.00  0.18  0.18  0.00  0.00  0.00
Crit Moves:                    ****                    ****
Green/Cycle: 0.00  0.00  0.37  0.37  0.00  0.00  0.00  0.58  0.58  0.00  0.00  0.00
Volume/Cap:  0.00  0.00  0.02  0.55  0.00  0.00  0.00  0.31  0.31  0.00  0.00  0.00
Delay/Veh:    0.0   0.0  14.0  19.9   0.0   0.0   0.0   5.1   5.1   0.0   0.0   0.0
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:   0.0   0.0  14.0  19.9   0.0   0.0   0.0   5.1   5.1   0.0   0.0   0.0
DesignQueue:   0     0     0    12     0     0     0    11     0     0     0     0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #60 Dwight Way / Telegraph Avenue
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.680
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       16.2
Optimal Cycle:       43              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    15    15     0     0     0    17    17    17     0     0     0
Lanes:       0  0  1  1  0   0  0  0  0  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0   697    78     0     0     0    66   479   565     0     0     0
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   0   697    78     0     0     0    66   479   565     0     0     0
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98
PHF Volume:    0   711    80     0     0     0    67   489   577     0     0     0
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   0   711    80     0     0     0    67   489   577     0     0     0
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Final Vol.:    0   711    80     0     0     0    67   489   577     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  1.00  0.94  0.94  1.00  1.00  1.00  0.81  0.81  0.81  1.00  1.00  1.00
Lanes:       0.00  1.80  0.20  0.00  0.00  0.00  0.12  0.88  1.00  0.00  0.00  0.00
Final Sat.:    0  3198   358     0     0     0   187  1354  1541     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.22  0.22  0.00  0.00  0.00  0.36  0.36  0.37  0.00  0.00  0.00
Crit Moves:        ****                                      ****
Green/Cycle: 0.00  0.33  0.33  0.00  0.00  0.00  0.55  0.55  0.55  0.00  0.00  0.00
Volume/Cap:  0.00  0.68  0.68  0.00  0.00  0.00  0.66  0.66  0.68  0.00  0.00  0.00
Delay/Veh:    0.0  21.5  21.5   0.0   0.0   0.0  12.3  12.3  12.8   0.0   0.0   0.0
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:   0.0  21.5  21.5   0.0   0.0   0.0  12.3  12.3  12.8   0.0   0.0   0.0
DesignQueue:   0    18     2     0     0     0     1     8    10     0     0     0
*******************************************************************************
```

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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #61 Dwight Way / College Avenue
********************************************************************************
Cycle (sec):        65              Critical Vol./Cap. (X):        0.439
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):       10.4
Optimal Cycle:      39              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   16    16    16   16     0    15   15    15     0    0     0
Lanes:       0  0  0  1  0   0  1  0  0  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  365    51    10  150     0    68  352    85     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  365    51    10  150     0    68  352    85     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    0  380    53    10  156     0    71  367    89     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  380    53    10  156     0    71  367    89     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0  380    53    10  156     0    71  367    89     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.98  0.98  0.98 0.98  1.00  0.90 0.90  0.90  1.00 1.00  1.00
Lanes:       0.00 0.88  0.12  0.06 0.94  0.00  0.27 1.39  0.34  0.00 0.00  0.00
Final Sat.:    0 1639   229   116 1737     0   462 2392   578     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.23  0.09 0.09  0.00  0.15 0.15  0.15  0.00 0.00  0.00
Crit Moves:       ****                               ****
Green/Cycle: 0.00 0.60  0.60  0.60 0.60  0.00  0.34 0.34  0.34  0.00 0.00  0.00
Volume/Cap:  0.00 0.39  0.39  0.15 0.15  0.00  0.45 0.45  0.45  0.00 0.00  0.00
Delay/Veh:    0.0  4.9   4.9   3.6  3.6   0.0  17.2 17.2  17.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  4.9   4.9   3.6  3.6   0.0  17.2 17.2  17.2   0.0  0.0   0.0
DesignQueue:    0    6     1     0    2     0     2    9     2     0    0     0
********************************************************************************
```



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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #62 Dwight Way / Piedmont Avenue / Warring Street
********************************************************************************
Cycle (sec):        65              Critical Vol./Cap. (X):        0.375
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):        9.4
Optimal Cycle:      61              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   22     0    29   29     0    24   24    24    24    0    24
Lanes:       0  0  1  1  0   0  1  1  0  0   1  0  1  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: 7:00 AM - 9:00 AM
Base Vol:      0  583     0     8  324     0    91  143   238    42    0    48
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  583     0     8  324     0    91  143   238    42    0    48
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    0  620     0     9  345     0    97  152   253    45    0    51
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  620     0     9  345     0    97  152   253    45    0    51
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0  620     0     9  345     0    97  152   253    45    0    51
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.95  0.89 0.89  1.00  0.73 1.00  0.85  0.79 1.00  0.79
Lanes:       0.00 2.00  0.00  0.05 1.95  0.00  1.00 1.00  1.00  0.47 0.00  0.53
Final Sat.:    0 3610     0    82 3319     0  1393 1900  1615   698    0   797
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.17  0.00  0.10 0.10  0.00  0.07 0.08  0.16  0.06 0.00  0.06
Crit Moves:       ****                                     ****
Green/Cycle: 0.00 0.50  0.00  0.50 0.50  0.00  0.45 0.45  0.45  0.45 0.00  0.45
Volume/Cap:  0.00 0.34  0.00  0.21 0.21  0.00  0.16 0.18  0.35  0.14 0.00  0.14
Delay/Veh:    0.0  8.0   0.0   7.2  7.2   0.0  11.2 11.3  13.2  11.1  0.0  11.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  8.0   0.0   7.2  7.2   0.0  11.2 11.3  13.2  11.1  0.0  11.1
DesignQueue:    0   12     0     0    6     0     2    3     5     1    0     1
********************************************************************************
```

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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #63 Dwight Avenue / Prospect Street
********************************************************************************
Average Delay (sec/veh):      6.2          Worst Case Level Of Service:        B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0    14    0   109   246   72     0     0   53    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    14    0   109   246   72     0     0   53    15
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:     0    0     0    15    0   114   256   75     0     0   55    16
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0    15    0   114   256   75     0     0   55    16
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   651 xxxx    63    71 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   437 xxxx  1007  1542 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   372 xxxx  1007  1542 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  843 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 10.0 xxxxx   7.8 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:    xxxxxx            10.0            xxxxxx           xxxxxx
ApproachLOS:       *                B                *                *
```



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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #64 Adeline Street / Ward Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.738
Loss Time (sec):      8 (Y+R =  6 sec) Average Delay (sec/veh):       14.9
Optimal Cycle:       52              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   25    25     0   25    25    19    0    19     0    0     0
Lanes:       0  0  0  1  0    0  0  2  0  1    2  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0  784     3     0  736   546   723    0     4     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  784     3     0  736   546   723    0     4     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:     0  817     3     0  767   569   753    0     4     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  817     3     0  767   569   753    0     4     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  817     3     0  767   569   753    0     4     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  1.00 0.95  0.85  0.92 1.00  0.85  1.00 1.00  1.00
Lanes:       0.00 0.99  0.01  0.00 2.00  1.00  2.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:     0 1891     7     0 3610  1615  3502    0  1615     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.43  0.43  0.00 0.21  0.35  0.22 0.00  0.00  0.00 0.00  0.00
Crit Moves:       ****                         ****
Green/Cycle: 0.00 0.58  0.58  0.00 0.58  0.58  0.29 0.00  0.29  0.00 0.00  0.00
Volume/Cap:  0.00 0.74  0.74  0.00 0.36  0.60  0.74 0.00  0.01  0.00 0.00  0.00
Delay/Veh:    0.0 14.3  14.3   0.0  7.6  11.5  25.4  0.0  16.4   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 14.3  14.3   0.0  7.6  11.5  25.4  0.0  16.4   0.0  0.0   0.0
DesignQueue:    0   13     0     0   12     9    20    0     0     0    0     0
********************************************************************************
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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM 4-Way Stop Method (Base Volume Alternative)
*******************************************************************************
Intersection #65 Derby Street / Warring Street
*******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        1.304
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):      150.3
Optimal Cycle:        0              Level Of Service:                  F
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0     0  650    0    31   14   20     0    0   34   779
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0  650    0    31   14   20     0    0   34   779
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:    0    0     0  714    0    34   15   22     0    0   37   856
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0  714    0    34   15   22     0    0   37   856
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0  714    0    34   15   22     0    0   37   856
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 0.95 0.00  0.05 0.41 0.59  0.00 0.00 0.04  0.96
Final Sat.:    0    0     0  578    0    28  214  306     0    0   29   656
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx 1.24 xxxx  1.24 0.07 0.07  xxxx  xxxx 1.30  1.30
Crit Moves:                  ****                 ****                    ****
Delay/Veh:    0.0  0.0   0.0 139.9  0.0 139.9 10.5 10.5   0.0   0.0  165 164.8
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 139.9  0.0 139.9 10.5 10.5   0.0   0.0  165 164.8
LOS by Move:   *    *     *    F    *     F    B    B     *     *    F     F
ApproachDel:    xxxxxx           139.9             10.5             164.8
Delay Adj:       xxxxx            1.00             1.00              1.00
ApprAdjDel:     xxxxxx           139.9             10.5             164.8
LOS by Appr:       *                F                B                 F
*******************************************************************************
```



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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #66 Derby Street / Claremont Blvd.
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.584
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       13.4
Optimal Cycle:       61              Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18    0    18    0    0     0    0   35    35   35   35     0
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      5    0    64    0    0     0    0  665    12   52  813     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   5    0    64    0    0     0    0  665    12   52  813     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97 0.97 0.97  0.97 0.97 0.97  0.97 0.97 0.97  0.97
PHF Volume:    5    0    66    0    0     0    0  686    12   54  838     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   5    0    66    0    0     0    0  686    12   54  838     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    5    0    66    0    0     0    0  686    12   54  838     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.87 1.00  0.87 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.07 0.00  0.93 0.00 0.00  0.00 0.00 0.98  0.02 0.06 0.94  0.00
Final Sat.:   120    0  1536    0    0     0    0 1863    34  114 1786     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.00  0.04 0.00 0.00  0.00 0.00 0.37  0.37 0.47 0.47  0.00
Crit Moves:  ****                                                  ****
Green/Cycle: 0.28 0.00  0.28 0.00 0.00  0.00 0.00 0.60  0.60 0.60 0.60  0.00
Volume/Cap:  0.16 0.00  0.16 0.00 0.00  0.00 0.00 0.61  0.61 0.78 0.78  0.00
Delay/Veh:   18.5  0.0  18.5  0.0  0.0   0.0  0.0 10.7  10.7 15.2 15.2   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  18.5  0.0  18.5  0.0  0.0   0.0  0.0 10.7  10.7 15.2 15.2   0.0
DesignQueue:   0    0     2    0    0     0    0   11     0    1   13     0
*******************************************************************************
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LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #67 Ashby Avenue / Seventh Street

Cycle (sec): 100 Critical Vol./Cap. (X): 0.850
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 34.3
Optimal Cycle: 90 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Split Phase			Split Phase	
Rights:		Include			Include			Include			Include	
Min. Green:	4	19	19	4	19	19	4	22	22	4	20	20
Lanes:		0 1 0 1 0			0 1 0 1 0			1 0 1 1 0			1 0 1 1 0	
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM												
Base Vol:	62	162	54	54	193	224	433	915	306	111	663	25
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	62	162	54	54	193	224	433	915	306	111	663	25
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	65	171	57	57	203	236	456	963	322	117	698	26
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	65	171	57	57	203	236	456	963	322	117	698	26
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	65	171	57	57	203	236	456	963	322	117	698	26
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.58	0.58	0.58	0.74	0.74	0.74	0.95	0.91	0.91	0.95	0.95	0.95
Lanes:	0.45	1.16	0.39	0.23	0.82	0.95	1.00	1.50	0.50	1.00	1.93	0.07
Final Sat.:	493	1289	430	323	1154	1340	1805	2602	870	1805	3461	131
Capacity Analysis Module:												
Vol/Sat:	0.13	0.13	0.13	0.18	0.18	0.18	0.25	0.37	0.37	0.06	0.20	0.20
Crit Moves:					****			****				****
Green/Cycle:	0.21	0.21	0.21	0.21	0.21	0.21	0.44	0.44	0.44	0.24	0.24	0.24
Volume/Cap:	0.64	0.64	0.64	0.85	0.85	0.85	0.58	0.85	0.85	0.27	0.85	0.85
Delay/Veh:	39.2	39.2	39.2	49.5	49.5	49.5	19.3	26.4	26.4	32.4	45.6	45.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.2	39.2	39.2	49.5	49.5	49.5	19.3	26.4	26.4	32.4	45.6	45.6
DesignQueue:	3	8	3	3	9	11	15	33	11	5	31	1

LBNL + UC Berkeley LRDP EIR
Existing Conditions
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #68 Ashby Avenue / San Pablo Avenue

Cycle (sec): 100 Critical Vol./Cap. (X): 0.738
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 28.7
Optimal Cycle: 54 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	4	17	17	4	19	19	18	18	18	18	18	18
Lanes:		1 0 1 1 0			1 0 1 1 0			1 0 1 1 0			0 1 0 1 0	
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM												
Base Vol:	173	521	53	137	741	128	84	584	134	51	613	135
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	173	521	53	137	741	128	84	584	134	51	613	135
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	188	566	58	149	805	139	91	635	146	55	666	147
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	188	566	58	149	805	139	91	635	146	55	666	147
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	188	566	58	149	805	139	91	635	146	55	666	147
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.93	0.93	0.19	0.92	0.92	0.74	0.74	0.74
Lanes:	1.00	1.82	0.18	1.00	1.71	0.29	1.00	1.63	0.37	0.13	1.53	0.34
Final Sat.:	1805	3231	329	1805	3011	520	352	2854	655	180	2166	477
Capacity Analysis Module:												
Vol/Sat:	0.10	0.18	0.18	0.08	0.27	0.27	0.26	0.22	0.22	0.31	0.31	0.31
Crit Moves:	****				****						****	
Green/Cycle:	0.14	0.34	0.34	0.16	0.36	0.36	0.42	0.42	0.42	0.42	0.42	0.42
Volume/Cap:	0.74	0.51	0.51	0.51	0.74	0.74	0.62	0.53	0.53	0.74	0.74	0.74
Delay/Veh:	52.0	26.6	26.6	39.9	30.1	30.1	31.1	22.3	22.3	27.1	27.1	27.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	52.0	26.6	26.6	39.9	30.1	30.1	31.1	22.3	22.3	27.1	27.1	27.1
DesignQueue:	9	21	2	7	30	5	3	22	5	2	23	5

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------------------------------------------------------------------------------
                       LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              AM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #69 Ashby Avenue / Adeline Street
******************************************************************************
Cycle (sec):        140              Critical Vol./Cap. (X):        0.539
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):       40.1
Optimal Cycle:       96              Level Of Service:                 D
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   38    38    6   38    38    4   22    22    4   32    32
Lanes:        1  0  1  1  0   1  0  2  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      74  567    61   11  438    96  189  564    49   83  549    14
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   74  567    61   11  438    96  189  564    49   83  549    14
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93
PHF Volume:    80  610    66   12  471   103  203  606    53   89  590    15
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   80  610    66   12  471   103  203  606    53   89  590    15
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    80  610    66   12  471   103  203  606    53   89  590    15
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.94  0.94 0.95 0.89  0.89 0.95 0.94  0.94 0.95 0.95  0.95
Lanes:       1.00 1.81  0.19 1.00 2.46  0.54 1.00 1.84  0.16 1.00 1.95  0.05
Final Sat.:  1805 3210   345 1805 4140   907 1805 3282   285 1805 3506    89
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.19  0.19 0.01 0.11  0.11 0.11 0.18  0.18 0.05 0.17  0.17
Crit Moves:       ****       ****            ****                  ****
Green/Cycle: 0.11 0.34  0.34 0.04 0.27  0.27 0.20 0.40  0.40 0.11 0.30  0.30
Volume/Cap:  0.40 0.56  0.56 0.15 0.42  0.42 0.56 0.47  0.47 0.47 0.56  0.56
Delay/Veh:   59.1 38.2  38.2 65.5 42.1  42.1 54.9 28.3  28.3 66.8 41.1  41.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  59.1 38.2  38.2 65.5 42.1  42.1 54.9 28.3  28.3 66.8 41.1  41.1
DesignQueue:    6   33     4    1   27     6   13   30     3    6   33     1
******************************************************************************
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------------------------------------------------------------------------------
                       LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              AM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #70 Ashby Avenue / Shattuck Avenue
******************************************************************************
Cycle (sec):         80              Critical Vol./Cap. (X):        0.483
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       14.9
Optimal Cycle:       53              Level Of Service:                 B
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    21   21    21    6   21    21   20   20    20   20   20    20
Lanes:        0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      77  590    26  124  450    35   33  557    31   40  550   182
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   77  590    26  124  450    35   33  557    31   40  550   182
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:    82  628    28  132  479    37   35  593    33   43  585   194
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   82  628    28  132  479    37   35  593    33   43  585   194
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    82  628    28  132  479    37   35  593    33   43  585   194
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.22 1.70  0.08 0.41 1.48  0.11 0.11 1.79  0.10 0.10 1.43  0.47
Final Sat.:   422 3235   143  774 2808   218  202 3408   190  197 2707   896
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.19  0.19 0.17 0.17  0.17 0.17 0.17  0.17 0.22 0.22  0.22
Crit Moves:       ****                                             ****
Green/Cycle: 0.33 0.33  0.33 0.41 0.41  0.41 0.52 0.52  0.52 0.52 0.52  0.52
Volume/Cap:  0.60 0.60  0.60 0.42 0.42  0.42 0.33 0.33  0.33 0.41 0.41  0.41
Delay/Veh:   24.7 24.7  24.7 17.8 17.8  17.8  8.4  8.4   8.4  9.0  9.0   9.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  24.7 24.7  24.7 17.8 17.8  17.8  8.4  8.4   8.4  9.0  9.0   9.0
DesignQueue:    3   20     1    4   13     1    1   13     1    1   13     4
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---------------------------------------------------------------------------------
                           LBNL + UC Berkeley LRDP EIR
                               Existing Conditions
                                  AM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
*********************************************************************************
Intersection #71 Ashby Avenue / Telegraph Avenue
*********************************************************************************
Cycle (sec):         80               Critical Vol./Cap. (X):        0.745
Loss Time (sec):     12 (Y+R =  6 sec) Average Delay (sec/veh):       26.3
Optimal Cycle:       62               Level Of Service:                  C
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted       Prot+Permit        Permitted        Permitted
Rights:           Include          Include           Include          Include
Min. Green:    21   21    21     0   21    21    25   25    25    25   25    25
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     150  985    80   148  623   103    86  549   120    89  573    83
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  150  985    80   148  623   103    86  549   120    89  573    83
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:   161 1059    86   159  670   111    92  590   129    96  616    89
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  161 1059    86   159  670   111    92  590   129    96  616    89
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   161 1059    86   159  670   111    92  590   129    96  616    89
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.25 0.94  0.94  0.95 0.93  0.93  0.25 0.92  0.92  0.24 0.93  0.93
Lanes:       1.00 1.85  0.15  1.00 1.72  0.28  1.00 1.64  0.36  1.00 1.75  0.25
Final Sat.:   483 3302   268  1805 3033   501   471 2882   630   454 3093   448
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.33 0.32  0.32  0.09 0.22  0.22  0.20 0.20  0.20  0.21 0.20  0.20
Crit Moves:  ****              ****                              ****
Green/Cycle: 0.38 0.38  0.38  0.48 0.48  0.48  0.33 0.33  0.33  0.33 0.33  0.33
Volume/Cap:  0.89 0.86  0.86  0.18 0.46  0.46  0.60 0.63  0.63  0.65 0.61  0.61
Delay/Veh:   66.7 30.2  30.2  12.3 14.7  14.7  38.3 24.8  24.8  42.3 24.4  24.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  66.7 30.2  30.2  12.3 14.7  14.7  38.3 24.8  24.8  42.3 24.4  24.4
DesignQueue:    5   31     3     4   16     3     3   18     4     3   19     3
*********************************************************************************
```



```
---------------------------------------------------------------------------------
                           LBNL + UC Berkeley LRDP EIR
                               Existing Conditions
                                  AM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
*********************************************************************************
Intersection #72 Ashby Avenue / College Avenue
*********************************************************************************
Cycle (sec):         80               Critical Vol./Cap. (X):        1.016
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       30.6
Optimal Cycle:      167               Level Of Service:                  C
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    30   30    30    30   30    30
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      79  323    26   118  232    95    33  490    92     4  611   229
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   79  323    26   118  232    95    33  490    92     4  611   229
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:    87  355    29   130  255   104    36  538   101     4  671   252
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   87  355    29   130  255   104    36  538   101     4  671   252
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    87  355    29   130  255   104    36  538   101     4  671   252
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.83 0.83  0.83  0.72 0.72  0.72  0.91 0.91  0.91  0.96 0.96  0.96
Lanes:       0.18 0.76  0.06  0.27 0.52  0.21  0.05 0.80  0.15  0.01 0.72  0.27
Final Sat.:   292 1193    96   365  718   294    93 1377   258     9 1322   495
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.30 0.30  0.30  0.36 0.36  0.36  0.39 0.39  0.39  0.51 0.51  0.51
Crit Moves:                        ****                               ****
Green/Cycle: 0.38 0.38  0.38  0.45 0.45  0.45  0.53 0.53  0.53  0.53 0.53  0.53
Volume/Cap:  0.79 0.79  0.79  0.79 0.79  0.79  0.74 0.74  0.74  0.97 0.97  0.97
Delay/Veh:   30.9 30.9  30.9  25.6 25.6  25.6  20.4 20.4  20.4  40.5 40.5  40.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  30.9 30.9  30.9  25.6 25.6  25.6  20.4 20.4  20.4  40.5 40.5  40.5
DesignQueue:    3   10     1     3    7     3     1   12     2     0   16     6
*********************************************************************************
```

```
--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #73 Ashby Avenue / Claremont Avenue
********************************************************************************
Cycle (sec):        80               Critical Vol./Cap. (X):        0.717
Loss Time (sec):    12 (Y+R =  6 sec) Average Delay (sec/veh):        22.0
Optimal Cycle:      72               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16    16   16    16    28   28    28    28   28    28
Lanes:       0  1  0  1  0   1  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      35  288   153   321  272    59    43  504    13    90  637   429
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   35  288   153   321  272    59    43  504    13    90  637   429
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    37  306   163   341  289    63    46  536    14    96  678   456
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   37  306   163   341  289    63    46  536    14    96  678   456
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    37  306   163   341  289    63    46  536    14    96  678   456
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
Lanes:       0.15 1.21  0.64  1.48 1.25  0.27  0.15 1.80  0.05  0.16 1.10  0.74
Final Sat.:   265 2184  1160  2666 2259   490   277 3249    84   281 1989  1340
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.14 0.14  0.14  0.13 0.13  0.13  0.17 0.17  0.17  0.34 0.34  0.34
Crit Moves:       ****             ****                              ****
Green/Cycle: 0.20 0.20  0.20  0.20 0.20  0.20  0.45 0.45  0.45  0.45 0.45  0.45
Volume/Cap:  0.70 0.70  0.70  0.64 0.64  0.64  0.37 0.37  0.37  0.76 0.76  0.76
Delay/Veh:   32.9 32.9  32.9  30.7 30.7  30.7  12.3 12.3  12.3  17.4 17.4  17.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  32.9 32.9  32.9  30.7 30.7  30.7  12.3 12.3  12.3  17.4 17.4  17.4
DesignQueue:    1   11     6    12   11     2     1   14     0     3   18    12
********************************************************************************
```



```
--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #74 Tunnel Road / SR 13
********************************************************************************
Cycle (sec):        65               Critical Vol./Cap. (X):        0.792
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):        15.9
Optimal Cycle:      56               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include            Ovl
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       0  0  2  0  1   2  0  1  0  0   0  0  0  0  0   1  0  0  0  2
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0 1293   435   487  608     0     0    0     0   205    0   307
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1293   435   487  608     0     0    0     0   205    0   307
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88
PHF Volume:     0 1469   494   553  691     0     0    0     0   233    0   349
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1469   494   553  691     0     0    0     0   233    0   349
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1469   494   553  691     0     0    0     0   233    0   349
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.85  0.92 1.00  1.00  1.00 1.00  1.00  0.95 1.00  0.75
Lanes:       0.00 2.00  1.00  2.00 1.00  0.00  0.00 0.00  0.00  1.00 0.00  2.00
Final Sat.:     0 3610  1615  3502 1900     0     0    0     0  1805    0  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.41  0.31  0.16 0.36  0.00  0.00 0.00  0.00  0.13 0.00  0.12
Crit Moves:       ****        ****                              ****
Green/Cycle: 0.00 0.51  0.51  0.20 1.00  0.00  0.00 0.00  0.00  0.16 0.00  0.36
Volume/Cap:  0.00 0.79  0.60  0.79 0.36  0.00  0.00 0.00  0.00  0.79 0.00  0.34
Delay/Veh:    0.0 15.3  12.2  30.9  0.1   0.0   0.0  0.0   0.0  39.7  0.0  15.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 15.3  12.2  30.9  0.1   0.0   0.0  0.0   0.0  39.7  0.0  15.2
DesignQueue:    0   28     9    17    0     0     0    0     0     7    0     8
********************************************************************************
```

```
---------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
*********************************************************************************
Intersection #167 Piedmont Avenue/ Channing Way
*********************************************************************************
Average Delay (sec/veh):      6.1          Worst Case Level Of Service:        E
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 29 Jan 2004 << 8:00-9:00AM
Base Vol:      65  457    24    23  308    38    25   19    23    20   58    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   65  457    24    23  308    38    25   19    23    20   58    18
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:    72  508    27    26  342    42    28   21    26    22   64    20
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    72  508    27    26  342    42    28   21    26    22   64    20
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  384 xxxx xxxxx   534 xxxx xxxxx  1122 1093   363  1103 1101   521
Potent Cap.: 1185 xxxx xxxxx  1044 xxxx xxxxx   185  216   686   190  214   559
Move Cap.:   1185 xxxx xxxxx  1044 xxxx xxxxx   124  197   686   157  195   559
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  8.2 xxxx xxxxx   8.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  202 xxxxx  xxxx  210 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 32.8 xxxxx xxxxx 38.5 xxxxx
Shared LOS:     *    *     *     *    *     *     *    D     *     *    E     *
ApproachDel:     xxxxxx           xxxxxx             32.8             38.5
ApproachLOS:        *                *                 D                E
```



```
---------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
*********************************************************************************
Intersection #1121 Hearst Avenue-Cyclotron Road/ Highland Place
*********************************************************************************
Average Delay (sec/veh):      1.9          Worst Case Level Of Service:        B
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 28 Jan 2004 << 5:00-6:00AM
Base Vol:       4    1     0    12    0    57    12  281     4     0   53     2
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    4    1     0    12    0    57    12  281     4     0   53     2
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:     4    1     0    13    0    63    13  312     4     0   59     2
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     4    1     0    13    0    63    13  312     4     0   59     2
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx   7.1 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  433  402 xxxxx   402 xxxx    60    61 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  537  540 xxxxx   563 xxxx  1011  1555 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    500  535 xxxxx   558 xxxx  1011  1555 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.3 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:  506 xxxx xxxxx  xxxx  886 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 12.2 xxxx xxxxx xxxxx  9.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     *    A     *     *    *     *     *    *     *
ApproachDel:      12.2              9.4            xxxxxx           xxxxxx
ApproachLOS:        B                A                 *                *
```

```
--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #1122 Stadium Rim Road/ Canyon Road
********************************************************************************
Average Delay (sec/veh):      0.1          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    0  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2003 << 8:00-9:00AM
Base Vol:       0  246     4     0  134     0     0    0     0     1    0     2
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  246     4     0  134     0     0    0     0     1    0     2
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:     0  273     4     0  149     0     0    0     0     1    0     2
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  273     4     0  149     0     0    0     0     1    0     2
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   424 xxxx   276
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   590 xxxx   768
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   590 xxxx   768
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  698 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 10.2 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    B     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             10.2
ApproachLOS:         *                *                *                B
```

Existing Conditions—P.M. Peak Hour

```
------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #1 Marin Avenue / San Pablo Avenue
******************************************************************************
Cycle (sec):         90              Critical Vol./Cap. (X):        0.940
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):      50.3
Optimal Cycle:      125              Level Of Service:                 D
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      227 1022   114   169  659    18    18  656   137   145  736   154
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   227 1022   114   169  659    18    18  656   137   145  736   154
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:    244 1099   123   182  709    19    19  705   147   156  791   166
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   244 1099   123   182  709    19    19  705   147   156  791   166
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    244 1099   123   182  709    19    19  705   147   156  791   166
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.95 0.94  0.94  0.95 0.95  0.95  0.95 0.93  0.93  0.95 0.93  0.93
Lanes:        1.00 1.80  0.20  1.00 1.95  0.05  1.00 1.65  0.35  1.00 1.65  0.35
Final Sat.:   1805 3199   357  1805 3500    96  1805 2909   607  1805 2908   608
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.14 0.34  0.34  0.10 0.20  0.20  0.01 0.24  0.24  0.09 0.27  0.27
Crit Moves:        ****        ****                  ****        ****
Green/Cycle:  0.17 0.33  0.33  0.09 0.33  0.33  0.10 0.30  0.30  0.10 0.30  0.30
Volume/Cap:   0.80 1.04  1.04  1.09 0.61  0.61  0.11 0.81  0.81  0.86 0.91  0.91
Delay/Veh:    49.8 67.7  67.7 137.2 26.3  26.3  37.1 33.8  33.8  72.3 41.5  41.5
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   49.8 67.7  67.7 137.2 26.3  26.3  37.1 33.8  33.8  72.3 41.5  41.5
DesignQueue:    10   39     4     8   25     1     1   26     5     7   29     6
******************************************************************************
```



```
------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #2 Marin Avenue / The Alameda
******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.640
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      14.9
Optimal Cycle:       56              Level Of Service:                 B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    25   25    25    25   25    25    23   23    23    23   23    23
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      316  322     1    43  178    77    50  534   193    17  480    69
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   316  322     1    43  178    77    50  534   193    17  480    69
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:    347  354     1    47  196    85    55  587   212    19  527    76
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   347  354     1    47  196    85    55  587   212    19  527    76
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    347  354     1    47  196    85    55  587   212    19  527    76
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.64 0.64  0.64  0.74 0.74  0.74  0.81 0.81  0.81  0.86 0.86  0.86
Lanes:        0.99 1.00  0.01  0.29 1.19  0.52  0.13 1.37  0.50  0.06 1.70  0.24
Final Sat.:   1205 1228     4   408 1689   731   197 2103   760    98 2772   398
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.29 0.29  0.29  0.12 0.12  0.12  0.28 0.28  0.28  0.19 0.19  0.19
Crit Moves:        ****                              ****
Green/Cycle:  0.42 0.42  0.42  0.42 0.42  0.42  0.50 0.50  0.50  0.50 0.50  0.50
Volume/Cap:   0.68 0.68  0.68  0.27 0.27  0.27  0.56 0.56  0.56  0.38 0.38  0.38
Delay/Veh:    20.2 20.2  20.2  13.8 13.8  13.8  13.6 13.6  13.6  11.5 11.5  11.5
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   20.2 20.2  20.2  13.8 13.8  13.8  13.6 13.6  13.6  11.5 11.5  11.5
DesignQueue:     8    8     0     1    4     2     1   12     4     0   11     2
******************************************************************************
```

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #3 Gilman Street / Sixth Street

Cycle (sec): 70 Critical Vol./Cap. (X): 0.934
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 74.8
Optimal Cycle: 99 Level Of Service: E

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Permitted	Permitted	Permitted	Permitted
Rights:	Include	Include	Include	Include
Min. Green:	19 19 19	19 19 19	19 19 19	19 19 19
Lanes:	0 0 1! 0 0	0 1 0 1 0	0 0 1! 0 0	0 0 1! 0 0

Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Base Vol:	346	46	159	24	47	52	28	497	109	53	489	11
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	346	46	159	24	47	52	28	497	109	53	489	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	372	49	171	26	51	56	30	534	117	57	526	12
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	372	49	171	26	51	56	30	534	117	57	526	12
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	372	49	171	26	51	56	30	534	117	57	526	12

Saturation Flow Module:

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.70	0.70	0.70	0.78	0.78	0.78	0.94	0.94	0.94	0.90	0.90	0.90
Lanes:	0.63	0.08	0.29	0.39	0.76	0.85	0.04	0.79	0.17	0.10	0.88	0.02
Final Sat.:	832	111	383	575	1126	1246	79	1406	308	164	1509	34

Capacity Analysis Module:

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Vol/Sat:	0.45	0.45	0.45	0.04	0.04	0.04	0.38	0.38	0.38	0.35	0.35	0.35
Crit Moves:		****						****				
Green/Cycle:	0.31	0.31	0.31	0.31	0.31	0.31	0.63	0.63	0.63	0.63	0.63	0.63
Volume/Cap:	1.42	1.42	1.42	0.14	0.14	0.14	0.60	0.60	0.60	0.55	0.55	0.55
Delay/Veh:	227.5	228	227.5	17.6	17.6	17.6	10.2	10.2	10.2	9.5	9.5	9.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	227.5	228	227.5	17.6	17.6	17.6	10.2	10.2	10.2	9.5	9.5	9.5
DesignQueue:	11	1	5	1	1	2	0	8	2	1	8	0

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #4 Gilman Street / San Pablo Avenue

Cycle (sec): 100 Critical Vol./Cap. (X): 0.778
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 42.2
Optimal Cycle: 82 Level Of Service: D

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Permitted	Permitted
Rights:	Include	Include	Include	Include
Min. Green:	4 35 35	4 35 35	31 31 31	31 31 31
Lanes:	1 0 1 1 0	1 0 1 1 0	0 1 0 1 0	0 0 1! 0 0

Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Base Vol:	140	1057	87	126	830	112	174	345	155	40	233	82
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	140	1057	87	126	830	112	174	345	155	40	233	82
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	149	1124	93	134	883	119	185	367	165	43	248	87
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	149	1124	93	134	883	119	185	367	165	43	248	87
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	149	1124	93	134	883	119	185	367	165	43	248	87

Saturation Flow Module:

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.93	0.93	0.59	0.59	0.59	0.80	0.80	0.80
Lanes:	1.00	1.85	0.15	1.00	1.76	0.24	0.52	1.02	0.46	0.11	0.66	0.23
Final Sat.:	1805	3299	272	1805	3124	421	580	1150	516	172	999	352

Capacity Analysis Module:

	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Vol/Sat:	0.08	0.34	0.34	0.07	0.28	0.28	0.32	0.32	0.32	0.25	0.25	0.25
Crit Moves:	****				****			****				
Green/Cycle:	0.15	0.35	0.35	0.15	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Volume/Cap:	0.55	0.97	0.97	0.50	0.77	0.77	0.87	0.87	0.87	0.68	0.68	0.68
Delay/Veh:	47.2	52.0	52.0	45.4	32.7	32.7	42.2	42.2	42.2	33.4	33.4	33.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.2	52.0	52.0	45.4	32.7	32.7	42.2	42.2	42.2	33.4	33.4	33.4
DesignQueue:	7	44	4	6	33	4	7	13	6	2	9	3

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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Rose Street / Shattuck Avenue
********************************************************************************
Cycle (sec):        70               Critical Vol./Cap. (X):        0.554
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        11.5
Optimal Cycle:      52               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    17   17    17    17   17    17    27   27    27    27   27    27
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     159  641    14   112  444    26    69  253    49    29  214   228
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  159  641    14   112  444    26    69  253    49    29  214   228
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:   171  689    15   120  477    28    74  272    53    31  230   245
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  171  689    15   120  477    28    74  272    53    31  230   245
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   171  689    15   120  477    28    74  272    53    31  230   245
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.45 0.95  0.95  0.34 0.94  0.94  0.81 0.81  0.85  0.90 0.90  0.90
Lanes:       1.00 1.96  0.04  1.00 1.89  0.11  0.21 0.79  1.00  0.06 0.45  0.49
Final Sat.:   853 3522    77   652 3383   198   328 1203  1615   106  780   831
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.20 0.20  0.20  0.18 0.14  0.14  0.23 0.23  0.03  0.30 0.30  0.30
Crit Moves:       ****                                                ****
Green/Cycle: 0.58 0.58  0.58  0.58 0.58  0.58  0.42 0.42  0.42  0.42 0.42  0.42
Volume/Cap:  0.35 0.34  0.34  0.32 0.24  0.24  0.54 0.54  0.08  0.70 0.70  0.70
Delay/Veh:    8.2  7.8   7.8   8.1  7.3   7.3  16.0 16.0  12.2  19.7 19.7  19.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   8.2  7.8   7.8   8.1  7.3   7.3  16.0 16.0  12.2  19.7 19.7  19.7
DesignQueue:    3   12     0     2    8     0     2    6     1     1    5     6
********************************************************************************
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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #6 Cedar Street / Martin Luther King Way
********************************************************************************
Cycle (sec):        65               Critical Vol./Cap. (X):        0.844
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):        25.1
Optimal Cycle:      66               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    20   20    20    20   20    20    20   20    20    20   20    20
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      53  614    65    30  541    12    20  297    57    68  296    65
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   53  614    65    30  541    12    20  297    57    68  296    65
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    56  646    68    32  569    13    21  313    60    72  312    68
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   56  646    68    32  569    13    21  313    60    72  312    68
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    56  646    68    32  569    13    21  313    60    72  312    68
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.92  0.92  0.94 0.94  0.94  0.94 0.94  0.94  0.80 0.80  0.80
Lanes:       0.07 0.84  0.09  0.05 0.93  0.02  0.05 0.80  0.15  0.16 0.69  0.15
Final Sat.:   126 1464   155    92 1663    37    96 1425   274   240 1043   229
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.44 0.44  0.44  0.34 0.34  0.34  0.22 0.22  0.22  0.30 0.30  0.30
Crit Moves:       ****                                                ****
Green/Cycle: 0.54 0.54  0.54  0.54 0.54  0.54  0.31 0.31  0.31  0.31 0.31  0.31
Volume/Cap:  0.82 0.82  0.82  0.64 0.64  0.64  0.71 0.71  0.71  0.97 0.97  0.97
Delay/Veh:   16.6 16.6  16.6  10.6 10.6  10.6  27.6 27.6  27.6  57.2 57.2  57.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  16.6 16.6  16.6  10.6 10.6  10.6  27.6 27.6  27.6  57.2 57.2  57.2
DesignQueue:    1   12     1     1   10     0     1    8     2     2    8     2
********************************************************************************
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LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #7 Cedar Street / Shattuck Avenue

Cycle (sec): 65 Critical Vol./Cap. (X): 0.649
Loss Time (sec): 8 (Y+R = 5 sec) Average Delay (sec/veh): 13.9
Optimal Cycle: 50 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	20	20	20	20	20	20	22	22	22	22	22	22
Lanes:	1 0 1 1 0			1 0 1 1 0			1 0 0 1 0			1 0 0 1 0		
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	138	795	56	144	619	72	86	275	67	59	341	150
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	138	795	56	144	619	72	86	275	67	59	341	150
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	152	874	62	158	680	79	95	302	74	65	375	165
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	152	874	62	158	680	79	95	302	74	65	375	165
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	152	874	62	158	680	79	95	302	74	65	375	165
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.36	0.94	0.94	0.31	0.93	0.93	0.18	0.97	0.97	0.36	0.95	0.95
Lanes:	1.00	1.87	0.13	1.00	1.79	0.21	1.00	0.80	0.20	1.00	0.69	0.31
Final Sat.:	678	3339	235	583	3182	370	346	1483	361	678	1259	554
Capacity Analysis Module:												
Vol/Sat:	0.22	0.26	0.26	0.27	0.21	0.21	0.27	0.20	0.20	0.10	0.30	0.30
Crit Moves:				****							****	
Green/Cycle:	0.53	0.53	0.53	0.53	0.53	0.53	0.34	0.34	0.34	0.34	0.34	0.34
Volume/Cap:	0.42	0.49	0.49	0.51	0.40	0.40	0.81	0.60	0.60	0.28	0.88	0.88
Delay/Veh:	5.9	3.3	3.3	8.3	2.9	2.9	62.6	22.1	22.1	18.8	36.7	36.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	5.9	3.3	3.3	8.3	2.9	2.9	62.6	22.1	22.1	18.8	36.7	36.7
DesignQueue:	3	16	1	3	12	1	2	8	2	2	10	4

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #8 Cedar Street / Oxford Street

Cycle (sec): 65 Critical Vol./Cap. (X): 0.791
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 21.8
Optimal Cycle: 56 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	16	16	16	16	16	16	16	16	16	16	16	16
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	91	464	81	17	196	17	18	307	57	61	340	31
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	91	464	81	17	196	17	18	307	57	61	340	31
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	100	510	89	19	215	19	20	337	63	67	374	34
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	100	510	89	19	215	19	20	337	63	67	374	34
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	100	510	89	19	215	19	20	337	63	67	374	34
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.90	0.90	0.90	0.93	0.93	0.93	0.95	0.95	0.95	0.88	0.88	0.88
Lanes:	0.14	0.73	0.13	0.07	0.86	0.07	0.05	0.80	0.15	0.14	0.79	0.07
Final Sat.:	244	1244	217	131	1513	131	85	1453	270	236	1318	120
Capacity Analysis Module:												
Vol/Sat:	0.41	0.41	0.41	0.14	0.14	0.14	0.23	0.23	0.23	0.28	0.28	0.28
Crit Moves:		****									****	
Green/Cycle:	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Volume/Cap:	0.84	0.84	0.84	0.29	0.29	0.29	0.61	0.61	0.61	0.75	0.75	0.75
Delay/Veh:	24.5	24.5	24.5	10.8	10.8	10.8	20.3	20.3	20.3	25.2	25.2	25.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.5	24.5	24.5	10.8	10.8	10.8	20.3	20.3	20.3	25.2	25.2	25.2
DesignQueue:	2	10	2	0	4	0	0	8	1	2	9	1

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                           LBNL + UC Berkeley LRDP EIR
                               Existing Conditions
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #9 Cedar Street / Euclid Avenue
********************************************************************************
Cycle (sec):          60                Critical Vol./Cap. (X):         0.479
Loss Time (sec):       8 (Y+R =  5 sec) Average Delay (sec/veh):         11.8
Optimal Cycle:        42                Level Of Service:                   B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted        Permitted        Permitted        Permitted
Rights:             Include          Include          Include          Include
Min. Green:    17   17    17    17   17    17    17   17    17    17   17     0
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      90  226    29     7  127    44    51  180    49    18   91     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   90  226    29     7  127    44    51  180    49    18   91     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:   100  251    32     8  141    49    57  200    54    20  101     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  100  251    32     8  141    49    57  200    54    20  101     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   100  251    32     8  141    49    57  200    54    20  101     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.86 0.86  0.86  0.95 0.95  0.95  0.90 0.90  0.90  0.93 0.93  1.00
Lanes:       0.26 0.66  0.08  0.04 0.71  0.25  0.18 0.65  0.17  0.17 0.83  0.00
Final Sat.:   427 1072   138    71 1291   447   313 1105   301   291 1470     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.23 0.23  0.23  0.11 0.11  0.11  0.18 0.18  0.18  0.07 0.07  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.49 0.49  0.49  0.49 0.49  0.49  0.38 0.38  0.38  0.38 0.38  0.00
Volume/Cap:  0.48 0.48  0.48  0.22 0.22  0.22  0.48 0.48  0.48  0.18 0.18  0.00
Delay/Veh:   10.7 10.7  10.7   8.9  8.9   8.9  14.7 14.7  14.7  12.6 12.6   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  10.7 10.7  10.7   8.9  8.9   8.9  14.7 14.7  14.7  12.6 12.6   0.0
DesignQueue:    2    4     1     0    2     1     1    4     1     0    2     0
********************************************************************************
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                           LBNL + UC Berkeley LRDP EIR
                               Existing Conditions
                                  PM Peak Hour
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                       Level Of Service Computation Report
              2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #10 Grizzly Peak Blvd / Centennial Drive
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap. (X):         0.796
Loss Time (sec):       0 (Y+R =  4 sec) Average Delay (sec/veh):         17.7
Optimal Cycle:         0                Level Of Service:                   C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:             Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     162   65   250    33   30     8     3  159    45    22  111    25
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  162   65   250    33   30     8     3  159    45    22  111    25
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.85 0.85  0.85  0.85 0.85  0.85  0.85 0.85  0.85  0.85 0.85  0.85
PHF Volume:   191   76   294    39   35     9     4  187    53    26  131    29
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  191   76   294    39   35     9     4  187    53    26  131    29
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   191   76   294    39   35     9     4  187    53    26  131    29
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.34 0.14  0.52  0.47 0.42  0.11  0.01 0.77  0.22  0.14 0.70  0.16
Final Sat.:   239   96   370   248  226    60     8  445   126    77  389    88
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.80 0.80  0.80  0.16 0.16  0.16  0.42 0.42  0.42  0.34 0.34  0.34
Crit Moves:             ****  ****              ****                        ****
Delay/Veh:   23.3 23.3  23.3   9.9  9.9   9.9  12.3 12.3  12.3  11.5 11.5  11.5
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  23.3 23.3  23.3   9.9  9.9   9.9  12.3 12.3  12.3  11.5 11.5  11.5
LOS by Move:    C    C     C     A    A     A     B    B     B     B    B     B
ApproachDel:      23.3              9.9             12.3             11.5
Delay Adj:        1.00             1.00             1.00             1.00
ApprAdjDel:       23.3              9.9             12.3             11.5
LOS by Appr:         C                A                B                B
********************************************************************************
```

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-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #11 Hearst Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.555
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        14.5
Optimal Cycle:       52               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    22   22    22    22   22    22    22   22    22    22   22    22
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      34  715    63   117  537    54    67  232    20   122  321   136
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   34  715    63   117  537    54    67  232    20   122  321   136
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:    37  786    69   129  590    59    74  255    22   134  353   149
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   37  786    69   129  590    59    74  255    22   134  353   149
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    37  786    69   129  590    59    74  255    22   134  353   149
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.36 0.94  0.94  0.26 0.94  0.94  0.69 0.69  0.69  0.71 0.71  0.71
Lanes:       1.00 1.84  0.16  1.00 1.82  0.18  0.42 1.45  0.13  0.42 1.11  0.47
Final Sat.:   692 3278   289   496 3234   325   553 1915   165   567 1491   632
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.24  0.24  0.26 0.18  0.18  0.13 0.13  0.13  0.24 0.24  0.24
Crit Moves:                   ****                                   ****
Green/Cycle: 0.41 0.41  0.41  0.41 0.41  0.41  0.39 0.39  0.39  0.39 0.39  0.39
Volume/Cap:  0.13 0.59  0.59  0.64 0.45  0.45  0.34 0.34  0.34  0.61 0.61  0.61
Delay/Veh:    8.5 11.1  11.1  23.9  9.7   9.7  17.1 17.1  17.1  21.1 21.1  21.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   8.5 11.1  11.1  23.9  9.7   9.7  17.1 17.1  17.1  21.1 21.1  21.1
DesignQueue:    1   20     2     3   15     2     2    7     1     4    9     4
********************************************************************************
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-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #12 Hearst Avenue / Oxford Avenue
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.973
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        52.8
Optimal Cycle:      131               Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    19   19    19    19   19    19    22   22    22    22   22    22
Lanes:        1  0  1  1  0   0  1  0  1  0   0  1  0  1  0   1  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      80  743   315    30  458    25    23  267   115   313  478    52
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   80  743   315    30  458    25    23  267   115   313  478    52
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    85  790   335    32  487    27    24  284   122   333  509    55
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   85  790   335    32  487    27    24  284   122   333  509    55
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    85  790   335    32  487    27    24  284   122   333  509    55
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.38 0.91  0.91  0.68 0.68  0.68  0.83 0.83  0.83  0.29 0.29  0.29
Lanes:       1.00 1.40  0.60  0.12 1.78  0.10  0.11 1.32  0.57  1.11 1.70  0.19
Final Sat.:   713 2421  1026   151 2307   126   179 2077   895   614  937   102
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.33  0.33  0.21 0.21  0.21  0.14 0.14  0.14  0.54 0.54  0.54
Crit Moves:       ****                                                ****
Green/Cycle: 0.35 0.35  0.35  0.35 0.35  0.35  0.46 0.46  0.46  0.46 0.46  0.46
Volume/Cap:  0.34 0.93  0.93  0.60 0.60  0.60  0.30 0.30  0.30  1.18 1.18  1.18
Delay/Veh:   20.7 36.3  36.3  21.9 21.9  21.9  13.2 13.2  13.2 114.4  114 114.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  20.7 36.3  36.3  21.9 21.9  21.9  13.2 13.2  13.2 114.4  114 114.4
DesignQueue:    2   23    10     1   14     1     1    7     3     8   12     1
********************************************************************************
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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #13 Hearst Avenue / Spruce Street
********************************************************************************
Average Delay (sec/veh):      0.9          Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:           Include          Include          Include           Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  1  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0   11    0    48   34  579     0     0  792    13
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   11    0    48   34  579     0     0  792    13
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0    0     0   12    0    51   36  616     0     0  843    14
Reduct Vol:     0    0     0    0    0     0    0    0     0     0    0     0
Final Vol.:     0    0     0   12    0    51   36  616     0     0  843    14
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx  6.8 xxxx   6.9  4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx  3.5 xxxx   3.3  2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx 1230 xxxx   428  856 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  173 xxxx   581  793 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  167 xxxx   581  793 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *    A    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  397 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 15.8 xxxxx   9.8 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    C     *    A    *     *     *    *     *
ApproachDel:    xxxxxx            15.8            xxxxxx            xxxxxx
ApproachLOS:       *                C                *                 *
```



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                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #14 Hearst Avenue / Arch Street / Le Conte Avenue
********************************************************************************
Average Delay (sec/veh):      2.4          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:           Include          Include          Include           Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0    6    0   135  146  439     0     0  668     6
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    6    0   135  146  439     0     0  668     6
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:     0    0     0    6    0   145  157  472     0     0  718     6
Reduct Vol:     0    0     0    0    0     0    0    0     0     0    0     0
Final Vol.:     0    0     0    6    0   145  157  472     0     0  718     6
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx  6.8 xxxx   6.9  4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx  3.5 xxxx   3.3  2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx 1272 xxxx   362  725 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  162 xxxx   640  887 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  140 xxxx   640  887 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *    A    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  556 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 13.9 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    B     *    *    *     *     *    *     *
ApproachDel:    xxxxxx            13.9            xxxxxx            xxxxxx
ApproachLOS:       *                B                *                 *
```

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #15 Hearst Avenue / Scenic Avenue

Average Delay (sec/veh): 1.1 Worst Case Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			0 0 0 0 1			0 0 2 0 0			0 0 1 1 0		
Volume Module: >> Count Date: 12 Nov 2002 << 4:00-6:00 PM												
Base Vol:	0	0	0	0	0	109	0	437	0	0	566	54
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	109	0	437	0	0	566	54
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	0	0	0	0	117	0	470	0	0	609	58
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	117	0	470	0	0	609	58
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	6.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	333	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	668	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	668	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	11.5	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	B	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			11.5			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #16 Hearst Avenue / Euclid Avenue

Cycle (sec): 70 Critical Vol./Cap. (X): 0.572
Loss Time (sec): 12 (Y+R = 3 sec) Average Delay (sec/veh): 16.9
Optimal Cycle: 58 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Prot+Permit			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	25	0	25	5	16	0	16	16	16
Lanes:	0 0 1! 0 0			0 0 1! 0 0			1 0 1 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM												
Base Vol:	4	0	1	57	0	115	120	307	0	2	503	23
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	0	1	57	0	115	120	307	0	2	503	23
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	4	0	1	59	0	120	125	320	0	2	524	24
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	0	1	59	0	120	125	320	0	2	524	24
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	4	0	1	59	0	120	125	320	0	2	524	24
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.88	1.00	0.88	0.83	1.00	0.83	0.95	1.00	1.00	0.99	0.99	0.99
Lanes:	0.80	0.00	0.20	0.33	0.00	0.67	1.00	1.00	0.00	0.01	0.95	0.04
Final Sat.:	1338	0	335	523	0	1055	1805	1900	0	7	1799	82
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.11	0.00	0.11	0.07	0.17	0.00	0.29	0.29	0.29
Crit Moves:				****			****				****	
Green/Cycle:	0.41	0.00	0.41	0.41	0.00	0.41	0.54	0.54	0.54	0.40	0.40	0.40
Volume/Cap:	0.01	0.00	0.01	0.28	0.00	0.28	0.13	0.31	0.00	0.73	0.73	0.73
Delay/Veh:	12.2	0.0	12.2	14.8	0.0	14.8	8.2	9.7	0.0	23.9	23.9	23.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.2	0.0	12.2	14.8	0.0	14.8	8.2	9.7	0.0	23.9	23.9	23.9
DesignQueue:	0	0	0	1	0	3	2	6	0	0	13	1

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LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour
--------------------------------------------------------------------------------
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #17 Hearst Avenue / Le Roy Avenue
********************************************************************************
Average Delay (sec/veh):      1.3          Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:        0    0     0   12    0    56   38  355     0     0  523    21
Growth Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0   12    0    56   38  355     0     0  523    21
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:      0    0     0   13    0    61   41  386     0     0  568    23
Reduct Vol:      0    0     0    0    0     0    0    0     0     0    0     0
Final Vol.:      0    0     0   13    0    61   41  386     0     0  568    23
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1048 xxxx   580   591 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   254 xxxx   518   994 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   246 xxxx   518   994 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT   LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  434 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 15.0 xxxxx   8.8 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    C     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            15.0           xxxxxx           xxxxxx
ApproachLOS:        *                C               *                *
```



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LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour
--------------------------------------------------------------------------------
Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #18 Hearst Avenue / Gayley Road / LaLoma Avenue
********************************************************************************
Cycle (sec):          70              Critical Vol./Cap. (X):        0.871
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       24.3
Optimal Cycle:        75              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     18   18    18   18   18    18   17   17    17    17   17    17
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      318  288    19    4  203    49   28   52   288    69  197    40
Growth Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   318  288    19    4  203    49   28   52   288    69  197    40
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:    349  316    21    4  223    54   31   57   316    76  216    44
Reduct Vol:      0    0     0    0    0     0    0    0     0     0    0     0
Reduced Vol:   349  316    21    4  223    54   31   57   316    76  216    44
PCE Adj:      1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    349  316    21    4  223    54   31   57   316    76  216    44
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900 1900 1900  1900 1900 1900  1900  1900 1900  1900
Adjustment:   0.69 0.69  0.69 0.97 0.97  0.97 0.86 0.86  0.86  0.82 0.82  0.85
Lanes:        0.51 0.46  0.03 0.02 0.79  0.19 0.08 0.14  0.78  0.26 0.74  1.00
Final Sat.:    667  604    40   29 1457   352  124  231  1277   403 1151  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.52 0.52  0.52 0.15 0.15  0.15 0.25 0.25  0.25  0.19 0.19  0.03
Crit Moves:        ****                            ****
Green/Cycle: 0.54 0.54  0.54 0.54 0.54  0.54 0.46 0.46  0.46  0.46 0.46  0.46
Volume/Cap:  0.97 0.97  0.97 0.28 0.28  0.28 0.54 0.54  0.54  0.41 0.41  0.06
Delay/Veh:   42.8 42.8  42.8  9.5  9.5   9.5 13.9 13.9  13.9  12.1 12.1   8.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  42.8 42.8  42.8  9.5  9.5   9.5 13.9 13.9  13.9  12.1 12.1   8.8
DesignQueue:    7    6     0    0    4     1    1    1     7     2    5     1
********************************************************************************
```

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---------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               PM Peak Hour
---------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*********************************************************************************
Intersection #19 Berkeley Way / Oxford Street
*********************************************************************************
Cycle (sec):         75             Critical Vol./Cap. (X):        0.447
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       7.4
Optimal Cycle:       46             Level Of Service:                 A
*********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18   18    18   18   18    20   20   20    20   20   20
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      48 1039    3     4  890   22    72    2   51    29   18   42
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   48 1039    3     4  890   22    72    2   51    29   18   42
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94
PHF Volume:    51 1105    3     4  947   23    77    2   54    31   19   45
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   51 1105    3     4  947   23    77    2   54    31   19   45
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:    51 1105    3     4  947   23    77    2   54    31   19   45
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.26 0.95 0.95  0.22 0.95 0.95  0.76 0.76 0.76  0.78 0.90 0.90
Lanes:       1.00 1.99 0.01  1.00 1.95 0.05  0.57 0.02 0.41  1.00 0.30 0.70
Final Sat.:   496 3600   10   410 3509   87   833   23  590  1482  510 1190
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.31 0.31  0.01 0.27 0.27  0.09 0.09 0.09  0.02 0.04 0.04
Crit Moves:       ****                            ****
Green/Cycle: 0.67 0.67 0.67  0.67 0.67 0.67  0.29 0.29 0.29  0.29 0.29 0.29
Volume/Cap:  0.15 0.46 0.46  0.02 0.40 0.40  0.32 0.32 0.32  0.07 0.13 0.13
Delay/Veh:    4.9  6.2  6.2   4.2  5.8  5.8  21.5 21.5 21.5  19.6 19.9 19.9
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   4.9  6.2  6.2   4.2  5.8  5.8  21.5 21.5 21.5  19.6 19.9 19.9
DesignQueue:    1   16    0     0   14    0     2    0    2     1    1    1
*********************************************************************************
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                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               PM Peak Hour
---------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*********************************************************************************
Intersection #20 University Avenue / Sixth Street
*********************************************************************************
Cycle (sec):        128             Critical Vol./Cap. (X):        1.072
Loss Time (sec):     16 (Y+R =  5 sec) Average Delay (sec/veh):      91.2
Optimal Cycle:      180             Level Of Service:                 F
*********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit        Permitted        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     6   23   23     0   23   23     6   15   15     6   15   15
Lanes:        1  0  1  0  1   1  0  1  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     343  353   48   101  239  465   163  827  212    42 1205   33
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  343  353   48   101  239  465   163  827  212    42 1205   33
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96
PHF Volume:   357  368   50   105  249  484   170  861  221    44 1255   34
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  357  368   50   105  249  484   170  861  221    44 1255   34
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   357  368   50   105  249  484   170  861  221    44 1255   34
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.95 1.00 0.85  0.19 1.00 0.85  0.95 0.92 0.92  0.95 0.95 0.95
Lanes:       1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.59 0.41  1.00 1.95 0.05
Final Sat.:  1805 1900 1615   367 1900 1615  1805 2784  714  1805 3500   96
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.20 0.19 0.03  0.29 0.13 0.30  0.09 0.31 0.31  0.02 0.36 0.36
Crit Moves:  ****                       ****  ****                   ****
Green/Cycle: 0.35 0.35 0.35  0.21 0.21 0.21  0.09 0.34 0.34  0.05 0.34 0.34
Volume/Cap:  0.56 0.55 0.09  1.36 0.62 1.42  1.10 0.90 0.90  0.52 1.04 1.04
Delay/Veh:   37.1 36.6 28.1 275.9 52.9 256.8 158.5 50.8 50.8  80.3 79.6 79.6
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  37.1 36.6 28.1 275.9 52.9 256.8 158.5 50.8 50.8  80.3 79.6 79.6
DesignQueue:   17   18    2     6   14   29    11   43   11     3   63    2
*********************************************************************************
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LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #21 University Avenue / San Pablo Avenue

Cycle (sec): 128 Critical Vol./Cap. (X): 0.880
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 152.6
Optimal Cycle: 124 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Include			Include			Include			Include	
Min. Green:	5	21	21	5	21	21	5	22	22	5	22	22
Lanes:		1 0 1 1 0			1 0 1 1 0			1 0 1 1 0			1 0 1 1 0	

Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM

Base Vol:	233	945	93	141	681	84	87	986	105	71	906	125
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	233	945	93	141	681	84	87	986	105	71	906	125
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	253	1027	101	153	740	91	95	1072	114	77	985	136
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	253	1027	101	153	740	91	95	1072	114	77	985	136
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	253	1027	101	153	740	91	95	1072	114	77	985	136

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.93	0.93	0.95	0.94	0.94	0.95	0.93	0.93
Lanes:	1.00	1.82	0.18	1.00	1.78	0.22	1.00	1.81	0.19	1.00	1.76	0.24
Final Sat.:	1805	3244	319	1805	3162	390	1805	3217	343	1805	3115	430

Capacity Analysis Module:

Vol/Sat:	0.14	0.32	0.32	0.08	0.23	0.23	0.05	0.33	0.33	0.04	0.32	0.32
Crit Moves:		****		****			****				****	
Green/Cycle:	0.09	0.34	0.34	0.09	0.34	0.34	0.12	0.23	0.23	0.05	0.23	0.23
Volume/Cap:	1.50	0.94	0.94	0.91	0.70	0.70	0.45	1.42	1.42	0.91	1.35	1.35
Delay/Veh:	309.6	56.8	56.8	105.3	40.2	40.2	59.3	246	245.6	136.3	214	213.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	309.6	56.8	56.8	105.3	40.2	40.2	59.3	246	245.6	136.3	214	213.9
DesignQueue:	17	52	5	10	37	5	6	62	7	5	57	8

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #22 University Avenue / Martin Luther King Way

Cycle (sec): 75 Critical Vol./Cap. (X): 0.776
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 31.8
Optimal Cycle: 66 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	5	23	23	23	23	23	17	17	17	17	17	17
Lanes:		1 0 1 1 0			1 0 1 1 0			1 0 1 1 0			1 0 1 1 0	

Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM

Base Vol:	282	902	78	46	702	77	80	679	134	71	727	81
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	282	902	78	46	702	77	80	679	134	71	727	81
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	294	940	81	48	731	80	83	707	140	74	757	84
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	294	940	81	48	731	80	83	707	140	74	757	84
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	294	940	81	48	731	80	83	707	140	74	757	84

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.21	0.94	0.94	0.17	0.93	0.93	0.17	0.94	0.94
Lanes:	1.00	1.84	0.16	1.00	1.80	0.20	1.00	1.67	0.33	1.00	1.80	0.20
Final Sat.:	1805	3283	284	397	3204	351	319	2940	580	315	3199	356

Capacity Analysis Module:

Vol/Sat:	0.16	0.29	0.29	0.12	0.23	0.23	0.26	0.24	0.24	0.23	0.24	0.24
Crit Moves:	****				****		****					
Green/Cycle:	0.13	0.52	0.52	0.39	0.39	0.39	0.33	0.33	0.33	0.33	0.33	0.33
Volume/Cap:	1.22	0.55	0.55	0.31	0.59	0.59	0.78	0.72	0.72	0.70	0.71	0.71
Delay/Veh:	166.3	10.1	10.1	19.8	18.5	18.5	65.1	25.8	25.8	54.4	25.5	25.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	166.3	10.1	10.1	19.8	18.5	18.5	65.1	25.8	25.8	54.4	25.5	25.5
DesignQueue:	11	20	2	1	20	2	2	21	4	2	22	2

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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #23 University Avenue / Milvia Street
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.474
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       16.6
Optimal Cycle:       49              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    21   21    21    21   21    21    20   20    20    20   20    20
Lanes:        1  0  0  1  0   0  0  1! 0  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     127  218    44    13  102    74    47  649   108    22  651    33
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  127  218    44    13  102    74    47  649   108    22  651    33
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:   134  229    46    14  107    78    49  683   114    23  685    35
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  134  229    46    14  107    78    49  683   114    23  685    35
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   134  229    46    14  107    78    49  683   114    23  685    35
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.70 0.98  0.98  0.92 0.92  0.92  0.81 0.81  0.81  0.87 0.87  0.87
Lanes:       1.00 0.83  0.17  0.07 0.54  0.39  0.12 1.61  0.27  0.06 1.85  0.09
Final Sat.:  1334 1541   311   120  945   685   180 2490   414   103 3034   154
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.15  0.15  0.11 0.11  0.11  0.27 0.27  0.27  0.23 0.23  0.23
Crit Moves:       ****                              ****
Green/Cycle: 0.35 0.35  0.35  0.35 0.35  0.35  0.47 0.47  0.47  0.47 0.47  0.47
Volume/Cap:  0.29 0.43  0.43  0.33 0.33  0.33  0.58 0.58  0.58  0.48 0.48  0.48
Delay/Veh:   19.4 20.9  20.9  19.5 19.5  19.5  16.0 16.0  16.0  14.5 14.5  14.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  19.4 20.9  20.9  19.5 19.5  19.5  16.0 16.0  16.0  14.5 14.5  14.5
DesignQueue:    4    6     1     0    3     2     1   16     3     1   16     1
********************************************************************************
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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #24 University Avenue / SB Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.711
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       18.2
Optimal Cycle:       56              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Protected        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    16   16    16    16   16    16    16   16    16
Lanes:        0  0  0  0  0   0  1  1  1  0   1  0  1  1  0   0  1  0  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0    55  576   146   131  374   254    74  642   640
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    55  576   146   131  374   254    74  642   640
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0    0     0    58  606   154   138  394   267    78  676   674
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0    58  606   154   138  394   267    78  676   674
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    0     0    58  606   154   138  394   267    78  676   674
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.77 0.77  0.77  0.86 0.80  0.80  0.69 0.69  0.69
Lanes:       0.00 0.00  0.00  0.21 2.23  0.56  1.00 1.19  0.81  0.16 1.42  1.42
Final Sat.:     0    0     0   312 3270   829  1625 1817  1234   213 1852  1846
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.19 0.19  0.19  0.08 0.22  0.22  0.36 0.36  0.36
Crit Moves:                        ****        ****                   ****
Green/Cycle: 0.00 0.00  0.00  0.23 0.23  0.23  0.36 0.36  0.36  0.67 0.67  0.67
Volume/Cap:  0.00 0.00  0.00  0.81 0.81  0.81  0.24 0.60  0.60  0.54 0.54  0.54
Delay/Veh:    0.0  0.0   0.0  34.1 34.1  34.1  17.7 22.1  22.1   7.2  7.2   7.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  34.1 34.1  34.1  17.7 22.1  22.1   7.2  7.2   7.2
DesignQueue:    0    0     0     2   20     5     4   11     7     1   10    10
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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #25 University Avenue / NB Shattuck Avenue
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.478
Loss Time (sec):     15 (Y+R =  4 sec) Average Delay (sec/veh):       17.1
Optimal Cycle:       47               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    19    0    19    0    0     0    0   13     0    0   13     0
Lanes:        2  0  1! 0  1   0  0  0  0  0   0  0  2  0  0   0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     938    0   208    0    0     0    0  454     0    0  433     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  938    0   208    0    0     0    0  454     0    0  433     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:   998    0   221    0    0     0    0  483     0    0  461     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  998    0   221    0    0     0    0  483     0    0  461     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   998    0   221    0    0     0    0  483     0    0  461     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.82 1.00  0.84 1.00 1.00  1.00 1.00 0.86  1.00 1.00 0.86  1.00
Lanes:       2.76 0.00  1.24 0.00 0.00  0.00 0.00 2.00  0.00 0.00 2.00  0.00
Final Sat.:  4275    0  1989    0    0     0    0 3249     0    0 3249     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.23 0.00  0.11 0.00 0.00  0.00 0.00 0.15  0.00 0.00 0.14  0.00
Crit Moves:  ****                                 ****       ****
Green/Cycle: 0.48 0.00  0.48 0.00 0.00  0.00 0.00 0.32  0.00 0.00 0.32  0.00
Volume/Cap:  0.49 0.00  0.23 0.00 0.00  0.00 0.00 0.46  0.00 0.00 0.44  0.00
Delay/Veh:   13.9  0.0  11.5  0.0  0.0   0.0  0.0 21.9   0.0  0.0 21.6   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  13.9  0.0  11.5  0.0  0.0   0.0  0.0 21.9   0.0  0.0 21.6   0.0
DesignQueue:   23    0     5    0    0     0    0   14     0    0   13     0
********************************************************************************
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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #26 University Avenue / Oxford Street
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.693
Loss Time (sec):      4 (Y+R =  4 sec) Average Delay (sec/veh):       18.2
Optimal Cycle:       58               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18   18   18    18   18   18    18   18   18    18
Lanes:        1  0  1  1  0   1  0  1  1  0   1  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     278  771    16   32  835   106  306   39   330    9   37    40
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  278  771    16   32  835   106  306   39   330    9   37    40
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:   296  820    17   34  888   113  326   41   351   10   39    43
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  296  820    17   34  888   113  326   41   351   10   39    43
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   296  820    17   34  888   113  326   41   351   10   39    43
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.86 0.85  0.85 0.27 0.84  0.84 0.60 0.60  0.77 0.83 0.83  0.83
Lanes:       1.00 1.96  0.04 1.00 1.77  0.23 1.77 0.23  1.00 0.10 0.43  0.47
Final Sat.:  1625 3173    66  520 2834   360 2029  259  1454  164  676   730
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.26  0.26 0.07 0.31  0.31 0.16 0.16  0.24 0.06 0.06  0.06
Crit Moves:  ****                 ****                  ****
Green/Cycle: 0.64 0.64  0.64 0.45 0.45  0.45 0.29 0.29  0.29 0.29 0.29  0.29
Volume/Cap:  0.28 0.40  0.40 0.14 0.69  0.69 0.56 0.56  0.84 0.20 0.20  0.20
Delay/Veh:    6.6  7.1   7.1 13.3 19.1  19.1 26.2 26.2  43.5 21.3 21.3  21.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   6.6  7.1   7.1 13.3 19.1  19.1 26.2 26.2  43.5 21.3 21.3  21.3
DesignQueue:    5   13     0    1   21     3   10    1    11    0    1     1
********************************************************************************
```

```
------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #27 Univeristy Drive (East Gate)  / Gayley Road
******************************************************************************
Average Delay (sec/veh):      2.2         Worst Case Level Of Service:       C
******************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Rights:           Include          Include          Include           Include
Lanes:        1  0  1  0  0    0  0  0  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      59  552     0     0  505    52    41    0    81     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   59  552     0     0  505    52    41    0    81     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    63  587     0     0  537    55    44    0    86     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    63  587     0     0  537    55    44    0    86     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  593 xxxx xxxxx  xxxx xxxx xxxxx  1278 xxxx   565  xxxx xxxx xxxxx
Potent Cap.:  993 xxxx xxxxx  xxxx xxxx xxxxx   185 xxxx   528  xxxx xxxx xxxxx
Move Cap.:    993 xxxx xxxxx  xxxx xxxx xxxxx   176 xxxx   528  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  8.9 xxxx xxxxx xxxxx xxxx xxxxx  32.0 xxxx  13.1 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     D    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            19.5             xxxxxx
ApproachLOS:        *                *                C                 *
```



```
------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #28 Addison Street / Oxford Street
******************************************************************************
Average Delay (sec/veh):      1.1         Worst Case Level Of Service:       C
******************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Rights:           Include          Include          Include           Include
Lanes:        1  0  2  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      32 1006     0     0  952    28    10    0   114     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   32 1006     0     0  952    28    10    0   114     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    34 1070     0     0 1013    30    11    0   121     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    34 1070     0     0 1013    30    11    0   121     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  890 xxxx xxxxx  xxxx xxxx xxxxx  1497 xxxx   325  xxxx xxxx xxxxx
Potent Cap.:  709 xxxx xxxxx  xxxx xxxx xxxxx   106 xxxx   624  xxxx xxxx xxxxx
Move Cap.:    709 xxxx xxxxx  xxxx xxxx xxxxx   103 xxxx   624  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 10.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  443 xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 16.6 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            16.6             xxxxxx
ApproachLOS:        *                *                C                 *
```

```
--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #29 Center Street / SB Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.494
Loss Time (sec):     12 (Y+R = 10 sec) Average Delay (sec/veh):       14.4
Optimal Cycle:       67              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0   30   30    30    0   17    17   25   25     0
Lanes:       0  0  0  0  0   0  1  1  1  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0     0   41  790   126    0  104   179   29  160     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0   41  790   126    0  104   179   29  160     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:    0    0     0   43  832   133    0  109   188   31  168     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0   43  832   133    0  109   188   31  168     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0   43  832   133    0  109   188   31  168     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.79 0.79  0.79 1.00 0.82  0.82 0.82 0.82  1.00
Lanes:       0.00 0.00  0.00 0.13 2.48  0.39 0.00 0.37  0.63 0.15 0.85  0.00
Final Sat.:    0    0     0  192 3701   590    0  575   990  239 1320     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.22 0.22  0.22 0.00 0.19  0.19 0.13 0.13  0.00
Crit Moves:                       ****             ****
Green/Cycle: 0.00 0.00  0.00 0.40 0.40  0.40 0.00 0.29  0.29 0.43 0.43  0.00
Volume/Cap:  0.00 0.00  0.00 0.56 0.56  0.56 0.00 0.65  0.65 0.30 0.30  0.00
Delay/Veh:    0.0  0.0   0.0 11.0 11.0  11.0  0.0 30.1  30.1  8.3  8.3   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 11.0 11.0  11.0  0.0 30.1  30.1  8.3  8.3   0.0
DesignQueue:   0    0     0    1   22     3    0    3     6    1    4     0
********************************************************************************
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--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #30 Center Street / NB Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.440
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        7.6
Optimal Cycle:       65              Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   40   40    40    0    0     0   17   17     0    0   17    17
Lanes:       0  1  1  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     50  982    86    0    0     0   81   55     0    0  139    58
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  50  982    86    0    0     0   81   55     0    0  139    58
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93
PHF Volume:   54 1056    92    0    0     0   87   59     0    0  149    62
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  54 1056    92    0    0     0   87   59     0    0  149    62
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   54 1056    92    0    0     0   87   59     0    0  149    62
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.80 0.80  0.80 1.00 1.00  1.00 0.71 0.71  1.00 1.00 0.86  0.86
Lanes:       0.13 2.64  0.23 0.00 0.00  0.00 0.60 0.40  0.00 0.00 0.71  0.29
Final Sat.:  204 4003   351    0    0     0  804  546     0    0 1158   483
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.26 0.26  0.26 0.00 0.00  0.00 0.11 0.11  0.00 0.00 0.13  0.13
Crit Moves:       ****                                                ****
Green/Cycle: 0.53 0.53  0.53 0.00 0.00  0.00 0.29 0.29  0.00 0.00 0.29  0.29
Volume/Cap:  0.49 0.49  0.49 0.00 0.00  0.00 0.37 0.37  0.00 0.00 0.44  0.44
Delay/Veh:    3.4  3.4   3.4  0.0  0.0   0.0 17.8 17.8   0.0  0.0 24.4  24.4
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   3.4  3.4   3.4  0.0  0.0   0.0 17.8 17.8   0.0  0.0 24.4  24.4
DesignQueue:   1   21     2    0    0     0    3    2     0    0    5     2
********************************************************************************
```

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #31 Center Street / Oxford Street

Cycle (sec):	75	Critical Vol./Cap. (X):	0.441
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	7.5
Optimal Cycle:	46	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	19	19	19	19	19	19	19	19	19	19	19	19
Lanes:	1 0 1 1 0			1 0 1 1 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 13 Nov 2000 << 4:00 - 6:00 PM												
Base Vol:	87	998	24	19	980	67	33	6	84	37	9	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	87	998	24	19	980	67	33	6	84	37	9	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	93	1062	26	20	1043	71	35	6	89	39	10	17
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	93	1062	26	20	1043	71	35	6	89	39	10	17
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	93	1062	26	20	1043	71	35	6	89	39	10	17
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.26	0.95	0.95	0.26	0.94	0.94	0.83	0.83	0.83	0.78	0.78	0.78
Lanes:	1.00	1.95	0.05	1.00	1.87	0.13	0.27	0.05	0.68	0.60	0.14	0.26
Final Sat.:	486	3515	85	500	3345	229	424	77	1080	884	215	382
Capacity Analysis Module:												
Vol/Sat:	0.19	0.30	0.30	0.04	0.31	0.31	0.08	0.08	0.08	0.04	0.04	0.04
Crit Moves:					****			****				
Green/Cycle:	0.68	0.68	0.68	0.68	0.68	0.68	0.27	0.27	0.27	0.27	0.27	0.27
Volume/Cap:	0.28	0.44	0.44	0.06	0.46	0.46	0.31	0.31	0.31	0.17	0.17	0.17
Delay/Veh:	6.8	6.1	6.1	4.3	6.2	6.2	23.9	23.9	23.9	22.0	22.0	22.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.8	6.1	6.1	4.3	6.2	6.2	23.9	23.9	23.9	22.0	22.0	22.0
DesignQueue:	1	15	0	0	15	1	1	0	3	1	0	1

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #32 Stadium Rim Road / Gayley Road

Cycle (sec):	100	Critical Vol./Cap. (X):	0.986
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	34.7
Optimal Cycle:	0	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 0 1 0			0 1 0 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	359	19	135	459	0	20	7	15	47	0	232
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	359	19	135	459	0	20	7	15	47	0	232
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	378	20	142	483	0	21	7	16	49	0	244
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	378	20	142	483	0	21	7	16	49	0	244
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	378	20	142	483	0	21	7	16	49	0	244
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.95	0.05	0.23	0.77	0.00	0.47	0.17	0.36	0.17	0.00	0.83
Final Sat.:	0	566	30	144	490	0	210	73	157	95	0	471
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.67	0.67	0.99	0.99	xxxx	0.10	0.10	0.10	0.52	xxxx	0.52
Crit Moves:		****		****			****			****		
Delay/Veh:	0.0	19.4	19.4	55.3	55.3	0.0	11.0	11.0	11.0	15.2	0.0	15.2
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	19.4	19.4	55.3	55.3	0.0	11.0	11.0	11.0	15.2	0.0	15.2
LOS by Move:	*	C	C	F	F	*	B	B	B	C	*	C
ApproachDel:		19.4			55.3			11.0			15.2	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		19.4			55.3			11.0			15.2	
LOS by Appr:		C			F			B			C	

```
------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #33 Allston Way / Oxford Street
********************************************************************************
Average Delay (sec/veh):      2.0          Worst Case Level Of Service:       D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  1  1  0  0    0  1  0  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      46 1002     0    26 1082    75    23    0   110     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   46 1002     0    26 1082    75    23    0   110     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    48 1044     0    27 1127    78    24    0   115     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    48 1044     0    27 1127    78    24    0   115     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1205 xxxx xxxxx  1044 xxxx xxxxx  1838 xxxx   603  xxxx xxxx xxxxx
Potent Cap.:  586 xxxx xxxxx   674 xxxx xxxxx    69 xxxx   447  xxxx xxxx xxxxx
Move Cap.:    586 xxxx xxxxx   674 xxxx xxxxx    62 xxxx   447  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 11.7 xxxx xxxxx  10.6 xxxx xxxxx  95.5 xxxx  15.8 xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     F    *     C     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 11.7 xxxx xxxxx  10.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             29.6           xxxxxx
ApproachLOS:        *                *                 D               *
```



```
------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #34 Kittridge Street / Oxford Street / Fulton Street
********************************************************************************
Average Delay (sec/veh):      6.6          Worst Case Level Of Service:       F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  1  1  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      45  995     0     0 1108    96    51    0    69     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   45  995     0     0 1108    96    51    0    69     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:    46 1026     0     0 1142    99    53    0    71     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    46 1026     0     0 1142    99    53    0    71     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1241 xxxx xxxxx  xxxx xxxx xxxxx  1797 xxxx   621  xxxx xxxx xxxxx
Potent Cap.:  568 xxxx xxxxx  xxxx xxxx xxxxx    73 xxxx   435  xxxx xxxx xxxxx
Move Cap.:    568 xxxx xxxxx  xxxx xxxx xxxxx    68 xxxx   435  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 11.9 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     *    *     *     *    *     *     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  133 xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 11.9 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  125 xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     *    *     *     *    F     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            124.9           xxxxxx
ApproachLOS:        *                *                 F               *
```

```
--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #35 Stadium Rim Road / Centennial Drive
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.579
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       12.2
Optimal Cycle:        0               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  0  0  0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0   99   140   102   57     0     0    0     0   204    0   146
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0   99   140   102   57     0     0    0     0   204    0   146
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.85 0.85  0.85  0.85 0.85  0.85  0.85 0.85  0.85  0.85 0.85  0.85
PHF Volume:     0  116   165   120   67     0     0    0     0   240    0   172
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  116   165   120   67     0     0    0     0   240    0   172
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  116   165   120   67     0     0    0     0   240    0   172
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 0.41  0.59  0.64 0.36  0.00  0.00 0.00  0.00  0.58 0.00  0.42
Final Sat.:     0  291   411   401  224     0     0    0     0   415    0   297
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.40  0.40  0.30 0.30  xxxx  xxxx xxxx  xxxx  0.58 xxxx  0.58
Crit Moves:       ****              ****                          ****
Delay/Veh:    0.0 10.8  10.8  10.5 10.5   0.0   0.0  0.0   0.0  13.9  0.0  13.9
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 10.8  10.8  10.5 10.5   0.0   0.0  0.0   0.0  13.9  0.0  13.9
LOS by Move:    *    B     B     B    B     *     *    *     *     B    *     B
ApproachDel:       10.8             10.5           xxxxxx             13.9
Delay Adj:         1.00             1.00            xxxxx             1.00
ApprAdjDel:        10.8             10.5           xxxxxx             13.9
LOS by Appr:         B                B                *                B
********************************************************************************
```



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--------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #36 Bancroft Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.670
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       12.7
Optimal Cycle:       43               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18     0     0   18    18     0    0     0    16   16    16
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      30 1186     0     0  949    23     1    0    38   258   97   111
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   30 1186     0     0  949    23     1    0    38   258   97   111
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    32 1248     0     0  999    24     1    0    40   272  102   117
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   32 1248     0     0  999    24     1    0    40   272  102   117
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    32 1248     0     0  999    24     1    0    40   272  102   117
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.25 0.86  1.00  1.00 0.85  0.85  0.78 1.00  0.78  0.67 0.83  0.83
Lanes:       1.00 2.00  0.00  0.00 1.95  0.05  0.03 0.00  0.97  1.00 0.47  0.53
Final Sat.:   479 3249     0     0 3159    77    38    0  1448  1265  734   840
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.38  0.00  0.00 0.32  0.32  0.03 0.00  0.03  0.21 0.14  0.14
Crit Moves:       ****                                            ****
Green/Cycle: 0.67 0.67  0.00  0.00 0.67  0.67  0.00 0.00  0.00  0.26 0.26  0.26
Volume/Cap:  0.10 0.58  0.00  0.00 0.47  0.47  xxxx 0.00  xxxx  0.83 0.54  0.54
Delay/Veh:    5.1  7.9   0.0   0.0  6.8   6.8   0.0  0.0   0.0  46.7 28.8  28.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   5.1  7.9   0.0   0.0  6.8   6.8   0.0  0.0   0.0  46.7 28.8  28.8
DesignQueue:    0   19     0     0   15     0     0    0     2     9    3     4
********************************************************************************
```

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #37 Bancroft Way / Fulton Street

Cycle (sec): 75 Critical Vol./Cap. (X): 0.409
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 6.7
Optimal Cycle: 49 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Ignore		
Min. Green:	17	17	0	0	17	17	0	0	0	24	24	24
Lanes:	0 1 1 0 0			0 0 2 1 0			0 0 0 0 0			0 1 1 0 1		
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	18	164	0	0	1066	165	0	0	0	12	287	898
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	18	164	0	0	1066	165	0	0	0	12	287	898
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.00
PHF Volume:	19	176	0	0	1146	177	0	0	0	13	309	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	19	176	0	0	1146	177	0	0	0	13	309	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Final Vol.:	19	176	0	0	1146	177	0	0	0	13	309	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.80	0.80	1.00	1.00	0.89	0.89	1.00	1.00	1.00	0.81	0.81	1.00
Lanes:	0.20	1.80	0.00	0.00	2.60	0.40	0.00	0.00	0.00	0.08	1.92	1.00
Final Sat.:	299	2726	0	0	4402	681	0	0	0	123	2945	1900
Capacity Analysis Module:												
Vol/Sat:	0.06	0.06	0.00	0.00	0.26	0.26	0.00	0.00	0.00	0.10	0.10	0.00
Crit Moves:					****						****	
Green/Cycle:	0.63	0.63	0.00	0.00	0.63	0.63	0.00	0.00	0.00	0.32	0.32	0.32
Volume/Cap:	0.10	0.10	0.00	0.00	0.42	0.42	0.00	0.00	0.00	0.33	0.33	0.00
Delay/Veh:	2.9	2.9	0.0	0.0	4.0	4.0	0.0	0.0	0.0	20.3	20.3	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	2.9	2.9	0.0	0.0	4.0	4.0	0.0	0.0	0.0	20.3	20.3	0.0
DesignQueue:	0	3	0	0	19	3	0	0	0	0	9	0

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #38 Bancroft Way / Ellsworth Street

Average Delay (sec/veh): 6.4 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	1 1 0 0 0			0 0 0 0 1			0 0 0 0 0			0 0 1 1 0		
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	348	11	0	0	0	100	0	0	0	0	877	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	348	11	0	0	0	100	0	0	0	0	877	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	366	12	0	0	0	105	0	0	0	0	923	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	366	12	0	0	0	105	0	0	0	0	923	6
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	xxxx	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	462	929	xxxxx	xxxx	xxxx	465	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	514	269	xxxxx	xxxx	xxxx	602	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	424	269	xxxxx	xxxx	xxxx	602	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	19.8	xxxx	xxxxx	xxxxx	xxxx	12.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	C	*	*	*	*	B	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	410	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	21.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	C	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	20.7			12.2			xxxxxx			xxxxxx		
ApproachLOS:	C			B			*			*		

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #39 Bancroft Way / Dana Street

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			0 0 0 0 0			0 0 0 0 0			0 1 2 0 0		
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	0	0	0	0	0	0	0	0	282	873	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	0	0	282	873	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	0	0	0	0	0	0	0	0	0	300	929	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	0	0	0	0	300	929	0
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	A	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	*			*			*			*		

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #40 Bancroft Way / Telegraph Avenue

Cycle (sec): 70 Critical Vol./Cap. (X): 0.344
Loss Time (sec): 8 (Y+R = 22 sec) Average Delay (sec/veh): 17.8
Optimal Cycle: 58 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	29	0	0	0	0	0	0	0	0	0	21	0
Lanes:	2 0 0 0 0			0 0 0 0 0			0 0 0 0 0			0 0 3 0 0		
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	495	0	0	0	0	0	0	0	0	0	675	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	495	0	0	0	0	0	0	0	0	0	675	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
PHF Volume:	556	0	0	0	0	0	0	0	0	0	758	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	556	0	0	0	0	0	0	0	0	0	758	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	556	0	0	0	0	0	0	0	0	0	758	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00
Final Sat.:	3502	0	0	0	0	0	0	0	0	0	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00
Crit Moves:	****										****	
Green/Cycle:	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00
Volume/Cap:	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00
Delay/Veh:	13.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	13.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.2	0.0
DesignQueue:	13	0	0	0	0	0	0	0	0	0	21	0

```
--------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #41 Bancroft Way / Bowditch Street
********************************************************************************
Cycle (sec):       100              Critical Vol./Cap. (X):        0.456
Loss Time (sec):     0 (Y+R =  4 sec) Average Delay (sec/veh):       11.5
Optimal Cycle:       0              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      191    0     0    0    0     0    0    0     0   99  494     0
Growth Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   191    0     0    0    0     0    0    0     0   99  494     0
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:      0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:    201    0     0    0    0     0    0    0     0  104  520     0
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   201    0     0    0    0     0    0    0     0  104  520     0
PCE Adj:      1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    201    0     0    0    0     0    0    0     0  104  520     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:        1.00 0.00  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.33 1.67  0.00
Final Sat.:    650    0     0    0    0     0    0    0     0  229 1163     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.31 xxxx  xxxx xxxx xxxx  xxxx xxxx xxxx  xxxx 0.46 0.45  xxxx
Crit Moves:   ****                                            ****
Delay/Veh:    10.6  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0 12.1 11.8   0.0
Delay Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   10.6  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0 12.1 11.8   0.0
LOS by Move:    B    *     *    *    *     *    *    *     *    B    B     *
ApproachDel:       10.6           xxxxxx           xxxxxx            11.8
Delay Adj:         1.00            xxxxx            xxxxx            1.00
ApprAdjDel:        10.6           xxxxxx           xxxxxx            11.8
LOS by Appr:         B               *                *                B
********************************************************************************
```



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--------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #42 Bancroft Way / College Avenue
********************************************************************************
Cycle (sec):       100              Critical Vol./Cap. (X):        0.569
Loss Time (sec):     0 (Y+R =  4 sec) Average Delay (sec/veh):       12.3
Optimal Cycle:       0              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      371    0     0    0    0     0    0    0     0   83  226     0
Growth Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   371    0     0    0    0     0    0    0     0   83  226     0
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:      0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:    408    0     0    0    0     0    0    0     0   91  248     0
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   408    0     0    0    0     0    0    0     0   91  248     0
PCE Adj:      1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    408    0     0    0    0     0    0    0     0   91  248     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:        1.00 0.00  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.54 1.46  0.00
Final Sat.:    716    0     0    0    0     0    0    0     0  324  911     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.57 xxxx  xxxx xxxx xxxx  xxxx xxxx xxxx  xxxx 0.28 0.27  xxxx
Crit Moves:   ****                                            ****
Delay/Veh:    14.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0 10.6 10.3   0.0
Delay Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   14.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0 10.6 10.3   0.0
LOS by Move:    B    *     *    *    *     *    *    *     *    B    B     *
ApproachDel:       14.0           xxxxxx           xxxxxx            10.4
Delay Adj:         1.00            xxxxx            xxxxx            1.00
ApprAdjDel:        14.0           xxxxxx           xxxxxx            10.4
LOS by Appr:         B               *                *                B
********************************************************************************
```

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-------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #43 Bancroft Way / Piedmont Avenue
********************************************************************************
Cycle (sec):        100             Critical Vol./Cap. (X):        0.825
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       20.9
Optimal Cycle:        0             Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     152  439    0    0  357  159    0    0    0    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  152  439    0    0  357  159    0    0    0    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90
PHF Volume:   169  488    0    0  397  177    0    0    0    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  169  488    0    0  397  177    0    0    0    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   169  488    0    0  397  177    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.26 0.74 0.00 0.00 0.69 0.31 0.00 0.00 0.00 0.00 0.00 0.00
Final Sat.:   205  592    0    0  567  252    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.82 0.82 xxxx xxxx 0.70 0.70 xxxx xxxx xxxx xxxx xxxx xxxx
Crit Moves:  ****                     ****
Delay/Veh:   24.6 24.6  0.0  0.0 16.7 16.7  0.0  0.0  0.0  0.0  0.0  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  24.6 24.6  0.0  0.0 16.7 16.7  0.0  0.0  0.0  0.0  0.0  0.0
LOS by Move:    C    C    *    *    C    C    *    *    *    *    *    *
ApproachDel:      24.6             16.7            xxxxxx           xxxxxx
Delay Adj:        1.00             1.00             xxxxx            xxxxx
ApprAdjDel:       24.6             16.7            xxxxxx           xxxxxx
LOS by Appr:        C                C                *                *
********************************************************************************
```



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-------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #44 Durant Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         75             Critical Vol./Cap. (X):        0.643
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       14.0
Optimal Cycle:       67             Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted      Prot+Permit       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   19   19   19   19   19   19   17   17   17    0    0    0
Lanes:       1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      69 1216  120   88 1099   51    9   72   55    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   69 1216  120   88 1099   51    9   72   55    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96
PHF Volume:    72 1267  125   92 1145   53    9   75   57    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   72 1267  125   92 1145   53    9   75   57    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    72 1267  125   92 1145   53    9   75   57    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  0.21 0.84 0.84 0.86 0.85 0.85 0.75 0.75 0.75 1.00 1.00 1.00
Lanes:       1.00 1.82 0.18 1.00 1.91 0.09 0.13 1.06 0.81 0.00 0.00 0.00
Final Sat.:   402 2919  288 1625 3083  143  190 1517 1159    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.43 0.43 0.06 0.37 0.37 0.05 0.05 0.05 0.00 0.00 0.00
Crit Moves:       ****      ****                     ****
Green/Cycle: 0.45 0.45 0.45 0.60 0.60 0.60 0.23 0.23 0.23 0.00 0.00 0.00
Volume/Cap:  0.39 0.96 0.96 0.09 0.62 0.62 0.21 0.21 0.21 0.00 0.00 0.00
Delay/Veh:   12.4 24.3 24.3  6.6  1.5  1.5 23.9 23.9 23.9  0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  12.4 24.3 24.3  6.6  1.5  1.5 23.9 23.9 23.9  0.0  0.0  0.0
DesignQueue:    2   31    3    2   20    1    0    2    2    0    0    0
********************************************************************************
```

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #45 Durant Avenue / Fulton Street

Cycle (sec):	75	Critical Vol./Cap. (X):	0.372
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	7.0
Optimal Cycle:	51	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	21	21	0	22	22	22	0	0	0
Lanes:	0 0 0 0 0			1 1 1 0 0			1 0 1 1 0			0 0 0 0 0		
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	0	0	527	760	0	137	219	33	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	527	760	0	137	219	33	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	0	0	567	817	0	147	235	35	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	567	817	0	147	235	35	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	567	817	0	147	235	35	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	0.95	1.00	0.98	0.93	0.93	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.23	1.77	0.00	1.00	1.74	0.26	0.00	0.00	0.00
Final Sat.:	0	0	0	2217	3198	0	1862	3075	463	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.26	0.26	0.00	0.08	0.08	0.08	0.00	0.00	0.00
Crit Moves:					****			****				
Green/Cycle:	0.00	0.00	0.00	0.65	0.65	0.00	0.30	0.30	0.30	0.00	0.00	0.00
Volume/Cap:	0.00	0.00	0.00	0.39	0.39	0.00	0.26	0.26	0.26	0.00	0.00	0.00
Delay/Veh:	0.0	0.0	0.0	2.9	2.9	0.0	21.1	20.5	20.5	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	2.9	2.9	0.0	21.1	20.5	20.5	0.0	0.0	0.0
DesignQueue:	0	0	0	9	12	0	4	7	1	0	0	0

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #46 Durant Avenue / Telegraph Avenue

Cycle (sec):	70	Critical Vol./Cap. (X):	0.361
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	13.1
Optimal Cycle:	43	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	18	18	0	0	0	17	17	0	0	0	0
Lanes:	0 0 1 1 0			0 0 0 0 0			0 1 2 0 0			0 0 0 0 0		
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	362	119	0	0	0	202	690	0	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	362	119	0	0	0	202	690	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	0	373	123	0	0	0	208	711	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	373	123	0	0	0	208	711	0	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	373	123	0	0	0	208	711	0	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	0.91	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00
Lanes:	0.00	1.51	0.49	0.00	0.00	0.00	0.68	2.32	0.00	0.00	0.00	0.00
Final Sat.:	0	2616	860	0	0	0	1175	4012	0	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.14	0.14	0.00	0.00	0.00	0.18	0.18	0.00	0.00	0.00	0.00
Crit Moves:		****						****				
Green/Cycle:	0.00	0.56	0.56	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00	0.00
Volume/Cap:	0.00	0.25	0.25	0.00	0.00	0.00	0.47	0.47	0.00	0.00	0.00	0.00
Delay/Veh:	0.0	5.5	5.5	0.0	0.0	0.0	17.2	17.2	0.0	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	5.5	5.5	0.0	0.0	0.0	17.2	17.2	0.0	0.0	0.0	0.0
DesignQueue:	0	7	2	0	0	0	5	18	0	0	0	0

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-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #47 Durant Avenue / College Avenue
*******************************************************************************
Cycle (sec):           70               Critical Vol./Cap. (X):        0.335
Loss Time (sec):        8 (Y+R =  4 sec) Average Delay (sec/veh):        13.4
Optimal Cycle:         42               Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted        Permitted        Permitted        Permitted
Rights:             Include          Include          Include          Include
Min. Green:     0   18    18     0    0     0    16   16    16     0    0     0
Lanes:        0  0  0  1  0   0  1  0  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  189    62    16   56     0   127  268   202     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  189    62    16   56     0   127  268   202     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:     0  203    67    17   60     0   137  288   217     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  203    67    17   60     0   137  288   217     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  203    67    17   60     0   137  288   217     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.97  0.97  0.93 0.93  1.00  0.94 0.89  0.89  1.00 1.00  1.00
Lanes:       0.00 0.75  0.25  0.22 0.78  0.00  1.00 1.14  0.86  0.00 0.00  0.00
Final Sat.:     0 1383   454   391 1367     0  1778 1927  1452     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.15  0.15  0.04 0.04  0.00  0.08 0.15  0.15  0.00 0.00  0.00
Crit Moves:       ****                               ****
Green/Cycle: 0.00 0.46  0.46  0.46 0.46  0.00  0.43 0.43  0.43  0.00 0.00  0.00
Volume/Cap:  0.00 0.32  0.32  0.10 0.10  0.00  0.18 0.35  0.35  0.00 0.00  0.00
Delay/Veh:    0.0 13.1  13.1  11.0 11.0   0.0  12.9 14.1  14.1   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 13.1  13.1  11.0 11.0   0.0  12.9 14.1  14.1   0.0  0.0   0.0
DesignQueue:    0    4     1     0    1     0     3    7     5     0    0     0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM 4-Way Stop Method (Base Volume Alternative)
*******************************************************************************
Intersection #48 Durant Avenue / Piedmont Avenue
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap. (X):        0.714
Loss Time (sec):        0 (Y+R =  4 sec) Average Delay (sec/veh):        17.6
Optimal Cycle:          0               Level Of Service:                  C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  1  0  0   0  0  1  0  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  398     0     0  427     0   179    0   197     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  398     0     0  427     0   179    0   197     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0  419     0     0  449     0   188    0   207     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  419     0     0  449     0   188    0   207     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  419     0     0  449     0   188    0   207     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 1.00  0.00  0.00 1.00  0.00  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:     0  622     0     0  629     0   488    0   580     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.67  xxxx  xxxx 0.71  xxxx  0.39 xxxx  0.36  xxxx xxxx  xxxx
Crit Moves:       ****              ****       ****
Delay/Veh:    0.0 18.9   0.0   0.0 20.8   0.0  13.9  0.0  11.6   0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 18.9   0.0   0.0 20.8   0.0  13.9  0.0  11.6   0.0  0.0   0.0
LOS by Move:    *    C     *     *    C     *     B    *     B     *    *     *
ApproachDel:      18.9             20.8             12.7           xxxxxx
Delay Adj:        1.00             1.00             1.00            xxxxx
ApprAdjDel:       18.9             20.8             12.7           xxxxxx
LOS by Appr:        C                C                B                *
*******************************************************************************
```

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #49 Channing Way / Shattuck Avenue

Cycle (sec): 75 Critical Vol./Cap. (X): 0.759
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 6.0
Optimal Cycle: 53 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	16	16	16	16	16	16	22	22	22	22	22	22
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1!	0 0	0 0	1!	0 0

Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	83	1279	94	19	1089	49	18	76	81	144	97	106
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	83	1279	94	19	1089	49	18	76	81	144	97	106
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	89	1375	101	20	1171	53	19	82	87	155	104	114
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	89	1375	101	20	1171	53	19	82	87	155	104	114
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	89	1375	101	20	1171	53	19	82	87	155	104	114

Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.23	0.94	0.94	0.18	0.94	0.94	0.89	0.89	0.89	0.74	0.74	0.74
Lanes:	1.00	1.86	0.14	1.00	1.91	0.09	0.10	0.43	0.47	0.41	0.28	0.31
Final Sat.:	435	3329	245	338	3434	155	174	733	781	584	393	430

Capacity Analysis Module:												
Vol/Sat:	0.21	0.41	0.41	0.06	0.34	0.34	0.11	0.11	0.11	0.27	0.27	0.27
Crit Moves:		****									****	
Green/Cycle:	0.59	0.59	0.59	0.59	0.59	0.59	0.36	0.36	0.36	0.36	0.36	0.36
Volume/Cap:	0.35	0.70	0.70	0.10	0.57	0.57	0.31	0.31	0.31	0.74	0.74	0.74
Delay/Veh:	3.9	2.2	2.2	1.2	1.4	1.4	18.6	18.6	18.6	30.1	30.1	30.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	3.9	2.2	2.2	1.2	1.4	1.4	18.6	18.6	18.6	30.1	30.1	30.1
DesignQueue:	2	25	2	0	21	1	1	2	2	4	3	3

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #50 Channing Way / Fulton Street

Cycle (sec): 100 Critical Vol./Cap. (X): 0.710
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 18.0
Optimal Cycle: 0 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	0 1	0	1 0	0 0	0	1 0	0 1	0	0 0

Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	0	0	48	686	61	0	133	38	15	257	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	48	686	61	0	133	38	15	257	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	0	0	0	52	746	66	0	145	41	16	279	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	52	746	66	0	145	41	16	279	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	52	746	66	0	145	41	16	279	0

Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.12	1.73	0.15	0.00	0.78	0.22	0.06	0.94	0.00
Final Sat.:	0	0	0	73	1065	96	0	454	130	33	562	0

Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	0.71	0.70	0.69	xxxx	0.32	0.32	0.50	0.50	xxxx
Crit Moves:				****				****			****	
Delay/Veh:	0.0	0.0	0.0	21.4	20.6	19.9	0.0	11.6	11.6	14.4	14.4	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	21.4	20.6	19.9	0.0	11.6	11.6	14.4	14.4	0.0
LOS by Move:	*	*	*	C	C	C	*	B	B	B	B	*
ApproachDel:	xxxxxx			20.6			11.6			14.4		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			20.6			11.6			14.4		
LOS by Appr:	*			C			B			B		

```
------------------------------------------------------------------------------
                      LBNL + UC Berkeley LRDP EIR
                          Existing Conditions
                             PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #51 Channing Way / Telegraph Avenue
******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.384
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       12.7
Optimal Cycle:       43              Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    0    0     0   17   17     0    0   17    17
Lanes:        0  1  0  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Sep 1997 << 4:00 - 6:00 PM
Base Vol:      86  410    41    0    0     0   23  144     0    0  227    46
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   86  410    41    0    0     0   23  144     0    0  227    46
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.88 0.88  0.88 0.88 0.88  0.88 0.88 0.88  0.88 0.88 0.88  0.88
PHF Volume:    98  466    47    0    0     0   26  164     0    0  258    52
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   98  466    47    0    0     0   26  164     0    0  258    52
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    98  466    47    0    0     0   26  164     0    0  258    52
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.93 0.93  0.93 1.00 1.00  1.00 0.93 0.93  1.00 1.00 0.98  0.98
Lanes:       0.32 1.53  0.15 0.00 0.00  0.00 0.14 0.86  0.00 0.00 0.83  0.17
Final Sat.:   565 2696   270    0    0     0  244 1527     0    0 1544   313
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17 0.17  0.17 0.00 0.00  0.00 0.11 0.11  0.00 0.00 0.17  0.17
Crit Moves:       ****                                              ****
Green/Cycle: 0.56 0.56  0.56 0.00 0.00  0.00 0.33 0.33  0.00 0.00 0.33  0.33
Volume/Cap:  0.31 0.31  0.31 0.00 0.00  0.00 0.33 0.33  0.00 0.00 0.51  0.51
Delay/Veh:    5.8  5.8   5.8  0.0  0.0   0.0 19.4 19.4   0.0  0.0 22.3  22.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   5.8  5.8   5.8  0.0  0.0   0.0 19.4 19.4   0.0  0.0 22.3  22.3
DesignQueue:    2    8     1    0    0     0    1    4     0    0    7     1
******************************************************************************
```



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------------------------------------------------------------------------------
                      LBNL + UC Berkeley LRDP EIR
                          Existing Conditions
                             PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #52 Channing Way / College Avenue
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.464
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       10.4
Optimal Cycle:       43              Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18   18   18    18   17   17    17   17   17    17
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      31  189    41    7  206    24    5   95    58  124  141    47
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   31  189    41    7  206    24    5   95    58  124  141    47
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.87 0.87  0.87 0.87 0.87  0.87 0.87 0.87  0.87 0.87 0.87  0.87
PHF Volume:    36  217    47    8  237    28    6  109    67  143  162    54
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   36  217    47    8  237    28    6  109    67  143  162    54
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    36  217    47    8  237    28    6  109    67  143  162    54
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.93 0.93  0.93 0.98 0.98  0.98 0.94 0.94  0.94 0.80 0.80  0.80
Lanes:       0.12 0.72  0.16 0.03 0.87  0.10 0.03 0.60  0.37 0.40 0.45  0.15
Final Sat.:   209 1276   277   55 1614   188   56 1073   655  602  684   228
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17 0.17  0.17 0.15 0.15  0.15 0.10 0.10  0.10 0.24 0.24  0.24
Crit Moves:       ****                                              ****
Green/Cycle: 0.60 0.60  0.60 0.60 0.60  0.60 0.41 0.41  0.41 0.41 0.41  0.41
Volume/Cap:  0.28 0.28  0.28 0.24 0.24  0.24 0.25 0.25  0.25 0.58 0.58  0.58
Delay/Veh:    4.1  4.1   4.1  3.9  3.9   3.9 13.5 13.5  13.5 18.9 18.9  18.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   4.1  4.1   4.1  3.9  3.9   3.9 13.5 13.5  13.5 18.9 18.9  18.9
DesignQueue:    1    3     1    0    3     0    0    2     1    3    4     1
******************************************************************************
```

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-----------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              PM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*****************************************************************************
Intersection #53 Haste Street / Shattuck Avenue
*****************************************************************************
Cycle (sec):          75                Critical Vol./Cap. (X):        0.704
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        10.0
Optimal Cycle:        57                Level Of Service:                  A
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    22   22    0     0   22   22     0    0    0    27   27   27
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     104 1277    0     0 1208   88     0    0    0   268  336  152
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  104 1277    0     0 1208   88     0    0    0   268  336  152
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93
PHF Volume:   112 1373    0     0 1299   95     0    0    0   288  361  163
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  112 1373    0     0 1299   95     0    0    0   288  361  163
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   112 1373    0     0 1299   95     0    0    0   288  361  163
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.16 0.95 1.00  1.00 0.94 0.94  1.00 1.00 1.00  0.89 0.89 0.89
Lanes:       1.00 2.00 0.00  0.00 1.86 0.14  0.00 0.00 0.00  0.71 0.89 0.40
Final Sat.:   306 3610    0     0 3331  243     0    0    0  1204 1510  683
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.37 0.38 0.00  0.00 0.39 0.39  0.00 0.00 0.00  0.24 0.24 0.24
Crit Moves:                       ****                             ****
Green/Cycle: 0.53 0.53 0.00  0.00 0.53 0.53  0.00 0.00 0.00  0.36 0.36 0.36
Volume/Cap:  0.69 0.71 0.00  0.00 0.73 0.73  0.00 0.00 0.00  0.66 0.66 0.66
Delay/Veh:   24.0  5.4  0.0   0.0  5.7  5.7   0.0  0.0  0.0  23.1 23.1 23.1
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  24.0  5.4  0.0   0.0  5.7  5.7   0.0  0.0  0.0  23.1 23.1 23.1
DesignQueue:    2   29    0     0   27    2     0    0    0     8   10    5
*****************************************************************************
```



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-----------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              PM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*****************************************************************************
Intersection #54 Haste Street / Fulton Street
*****************************************************************************
Cycle (sec):          80                Critical Vol./Cap. (X):        0.494
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        18.9
Optimal Cycle:        53                Level Of Service:                  B
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0   25   25     0    0    0    20   20    0
Lanes:        0  0  0  0  0   0  0  1  1  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0    0     0  580  154     0    0    0    50  604    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0    0    0     0  580  154     0    0    0    50  604    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.88 0.88 0.88  0.88 0.88 0.88  0.88 0.88 0.88  0.88 0.88 0.88
PHF Volume:     0    0    0     0  659  175     0    0    0    57  686    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0    0    0     0  659  175     0    0    0    57  686    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:     0    0    0     0  659  175     0    0    0    57  686    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  1.00 1.00 1.00  1.00 0.92 0.92  1.00 1.00 1.00  0.95 0.95 1.00
Lanes:       0.00 0.00 0.00  0.00 1.58 0.42  0.00 0.00 0.00  0.15 1.85 0.00
Final Sat.:     0    0    0     0 2764  734     0    0    0   276 3334    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00  0.00 0.24 0.24  0.00 0.00 0.00  0.21 0.21 0.00
Crit Moves:                       ****                             ****
Green/Cycle: 0.00 0.00 0.00  0.00 0.69 0.69  0.00 0.00 0.00  0.26 0.26 0.00
Volume/Cap:  0.00 0.00 0.00  0.00 0.35 0.35  0.00 0.00 0.00  0.78 0.78 0.00
Delay/Veh:    0.0  0.0  0.0   0.0  5.5  5.5   0.0  0.0  0.0  33.9 33.9  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   0.0  0.0  0.0   0.0  5.5  5.5   0.0  0.0  0.0  33.9 33.9  0.0
DesignQueue:    0    0    0     0   10    3     0    0    0     2   23    0
*****************************************************************************
```

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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #55 Haste Street / Telegraph Avenue
*******************************************************************************
Cycle (sec):          70                Critical Vol./Cap. (X):        0.416
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        12.5
Optimal Cycle:        40                Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    16   16     0    0    0     0    0    0     0    0   16    16
Lanes:        0  1  1  0  0   0  0  0  0  0   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     186  476     0    0    0     0    0    0     0    0  470    57
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  186  476     0    0    0     0    0    0     0    0  470    57
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:   207  529     0    0    0     0    0    0     0    0  522    63
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  207  529     0    0    0     0    0    0     0    0  522    63
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   207  529     0    0    0     0    0    0     0    0  522    63
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.95  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.93  0.93
Lanes:       0.56 1.44  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 1.78  0.22
Final Sat.:  1014 2596     0    0    0     0    0    0     0    0 3168   384
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.20 0.20  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.16  0.16
Crit Moves:       ****                                             ****
Green/Cycle: 0.40 0.40  0.40 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.55  0.55
Volume/Cap:  0.51 0.51  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.30  0.30
Delay/Veh:   15.4 15.4   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  8.9   8.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  15.4 15.4   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  8.9   8.9
DesignQueue:    5   13     0    0    0     0    0    0     0    0    9     1
*******************************************************************************
```



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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #56 Haste Street / College Avenue
*******************************************************************************
Cycle (sec):          70                Critical Vol./Cap. (X):        0.405
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):         9.3
Optimal Cycle:        40                Level Of Service:                  A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    16   16     0    0   16    16    0    0     0   16   16    16
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      88  236     0    0  337    56    0    0     0   90  244    29
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   88  236     0    0  337    56    0    0     0   90  244    29
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.88 0.88  0.88 0.88 0.88  0.88 0.88 0.88  0.88 0.88 0.88  0.88
PHF Volume:   100  268     0    0  383    64    0    0     0  102  277    33
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  100  268     0    0  383    64    0    0     0  102  277    33
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   100  268     0    0  383    64    0    0     0  102  277    33
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.80 0.80  1.00 1.00 0.98  0.98 1.00 1.00  1.00 0.93 0.93  0.93
Lanes:       0.27 0.73  0.00 0.00 0.86  0.14 0.00 0.00  0.00 0.50 1.34  0.16
Final Sat.:   413 1109     0    0 1598   266    0    0     0  874 2369   282
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.24  0.00 0.00 0.24  0.24 0.00 0.00  0.00 0.12 0.12  0.12
Crit Moves:       ****                                             ****
Green/Cycle: 0.70 0.70  0.00 0.00 0.70  0.70 0.00 0.00  0.00 0.25 0.25  0.25
Volume/Cap:  0.35 0.35  0.00 0.00 0.34  0.34 0.00 0.00  0.00 0.47 0.47  0.47
Delay/Veh:    2.0  2.0   0.0  0.0  1.8   1.8  0.0  0.0   0.0 24.1 24.1  24.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   2.0  2.0   0.0  0.0  1.8   1.8  0.0  0.0   0.0 24.1 24.1  24.1
DesignQueue:    1    3     0    0    5     1    0    0     0    3    8     1
*******************************************************************************
```

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-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #57 Dwight Way / Martin Luther King Way
*******************************************************************************
Cycle (sec):         75                Critical Vol./Cap. (X):        0.871
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):        17.6
Optimal Cycle:       85                Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18    18   18    18    21   21    21     0    0     0
Lanes:       0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     71  821    60   113  860   272    49  444   111     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  71  821    60   113  860   272    49  444   111     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:   76  873    64   120  915   289    52  472   118     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  76  873    64   120  915   289    52  472   118     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   76  873    64   120  915   289    52  472   118     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.69 0.69  0.69  0.64 0.64  0.64  0.90 0.90  0.90  1.00 1.00  1.00
Lanes:       0.15 1.72  0.13  0.18 1.38  0.44  0.16 1.47  0.37  0.00 0.00  0.00
Final Sat.:   195 2258   165   221 1683   532   277 2507   627     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.39 0.39  0.39  0.54 0.54  0.54  0.19 0.19  0.19  0.00 0.00  0.00
Crit Moves:                        ****             ****
Green/Cycle: 0.49 0.49  0.49  0.61 0.61  0.61  0.31 0.31  0.31  0.00 0.00  0.00
Volume/Cap:  0.78 0.78  0.78  0.89 0.89  0.89  0.60 0.60  0.60  0.00 0.00  0.00
Delay/Veh:   17.0 17.0  17.0  14.8 14.8  14.8  24.3 24.3  24.3   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  17.0 17.0  17.0  14.8 14.8  14.8  24.3 24.3  24.3   0.0  0.0   0.0
DesignQueue:    2   20     1     2   16     5     2   14     4     0    0     0
*******************************************************************************
```



```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #58 Dwight Way / Shattuck Avenue
*******************************************************************************
Cycle (sec):         75                Critical Vol./Cap. (X):        0.841
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):        12.9
Optimal Cycle:       78                Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       0  0  1  1  0    1  0  1  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0 1273   123   133 1390     0    77  426   200     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1273   123   133 1390     0    77  426   200     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    0 1326   128   139 1448     0    80  444   208     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0 1326   128   139 1448     0    80  444   208     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0 1326   128   139 1448     0    80  444   208     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  0.24 0.95  0.95  0.87 0.87  0.87  1.00 1.00  1.00
Lanes:       0.00 1.82  0.18  1.00 2.00  0.00  0.22 1.21  0.57  0.00 0.00  0.00
Final Sat.:     0 3249   314   462 3610     0   362 2003   941     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.41  0.41  0.30 0.40  0.00  0.22 0.22  0.22  0.00 0.00  0.00
Crit Moves:       ****        ****                   ****
Green/Cycle: 0.00 0.49  0.49  0.58 0.58  0.00  0.26 0.26  0.26  0.00 0.00  0.00
Volume/Cap:  0.00 0.84  0.84  0.52 0.70  0.00  0.84 0.84  0.84  0.00 0.00  0.00
Delay/Veh:    0.0 11.4  11.4  10.9  3.0   0.0  35.8 35.8  35.8   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 11.4  11.4  10.9  3.0   0.0  35.8 35.8  35.8   0.0  0.0   0.0
DesignQueue:    0   31     3     5   28     0     3   14     7     0    0     0
*******************************************************************************
```

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-------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #59 Dwight Way / Fulton Street
*******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.554
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       14.0
Optimal Cycle:       45              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted        Permitted        Permitted        Permitted
Rights:            Include          Include          Include          Include
Min. Green:     0    0    21    21    0     0     0   16    16     0    0     0
Lanes:        0  0  0  0  1    2  0  0  0  0    0  0  1  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0    62   631    0     0     0  664    15     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0    62   631    0     0     0  664    15     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0    0    65   664    0     0     0  699    16     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0    65   664    0     0     0  699    16     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    0    65   664    0     0     0  699    16     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  0.87  0.59 1.00  1.00  1.00 0.95  0.95  1.00 1.00  1.00
Lanes:       0.00 0.00  1.00  2.00 0.00  0.00  0.00 1.96  0.04  0.00 0.00  0.00
Final Sat.:     0    0  1644  2241    0     0     0 3520    80     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.04  0.30 0.00  0.00  0.00 0.20  0.20  0.00 0.00  0.00
Crit Moves:                   ****                  ****
Green/Cycle: 0.00 0.00  0.55  0.55 0.00  0.00  0.00 0.41  0.41  0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.07  0.54 0.00  0.00  0.00 0.49  0.49  0.00 0.00  0.00
Delay/Veh:    0.0  0.0   8.2  12.7  0.0   0.0   0.0 15.8  15.8   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   8.2  12.7  0.0   0.0   0.0 15.8  15.8   0.0  0.0   0.0
DesignQueue:    0    0     1    13    0     0     0   18     0     0    0     0
*******************************************************************************
```



```
-------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                            Existing Conditions
                               PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #60 Dwight Way / Telegraph Avenue
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.851
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       20.2
Optimal Cycle:       70              Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:          Permitted        Permitted        Permitted        Permitted
Rights:            Include          Include          Include          Include
Min. Green:     0   15    15     0    0     0    17   17    17     0    0     0
Lanes:        0  0  1  1  0    0  0  0  0  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  590   149     0    0     0   130  671   813     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  590   149     0    0     0   130  671   813     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98  0.98 0.98  0.98
PHF Volume:     0  602   152     0    0     0   133  685   830     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  602   152     0    0     0   133  685   830     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  602   152     0    0     0   133  685   830     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.92  0.92  1.00 1.00  1.00  0.81 0.81  0.81  1.00 1.00  1.00
Lanes:       0.00 1.60  0.40  0.00 0.00  0.00  0.16 0.84  1.00  0.00 0.00  0.00
Final Sat.:     0 2796   706     0    0     0   250 1291  1541     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.22  0.22  0.00 0.00  0.00  0.53 0.53  0.54  0.00 0.00  0.00
Crit Moves:       ****                                    ****
Green/Cycle: 0.00 0.25  0.39  0.00 0.00  0.00  0.63 0.63  0.63  0.00 0.00  0.00
Volume/Cap:  0.00 0.85  0.56  0.00 0.00  0.00  0.84 0.84  0.85  0.00 0.00  0.00
Delay/Veh:    0.0 35.5  17.0   0.0  0.0   0.0  14.5 14.5  15.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 35.5  17.0   0.0  0.0   0.0  14.5 14.5  15.2   0.0  0.0   0.0
DesignQueue:    0   18     4     0    0     0     2   11    13     0    0     0
*******************************************************************************
```

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--------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #61 Dwight Way / College Avenue
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.535
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       15.2
Optimal Cycle:       39              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0   16    16    16   16     0    15   15    15     0    0     0
Lanes:        0  0  0  1  0    0  1  0  0  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  294    52    49  374     0    34  483   129     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  294    52    49  374     0    34  483   129     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:     0  323    57    54  411     0    37  531   142     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  323    57    54  411     0    37  531   142     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  323    57    54  411     0    37  531   142     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.98  0.98  0.93 0.93  1.00  0.89 0.89  0.89  1.00 1.00  1.00
Lanes:       0.00 0.85  0.15  0.12 0.88  0.00  0.10 1.50  0.40  0.00 0.00  0.00
Final Sat.:     0 1582   280   204 1554     0   179 2540   678     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.20  0.20  0.26 0.26  0.00  0.21 0.21  0.21  0.00 0.00  0.00
Crit Moves:                        ****             ****
Green/Cycle: 0.00 0.59  0.59  0.59 0.59  0.00  0.29 0.29  0.29  0.00 0.00  0.00
Volume/Cap:  0.00 0.34  0.34  0.45 0.45  0.00  0.72 0.72  0.72  0.00 0.00  0.00
Delay/Veh:    0.0  5.1   5.1   6.0  6.0   0.0  26.6 26.6  26.6   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  5.1   5.1   6.0  6.0   0.0  26.6 26.6  26.6   0.0  0.0   0.0
DesignQueue:    0    5     1     1    7     0     1   15     4     0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                        LBNL + UC Berkeley LRDP EIR
                           Existing Conditions
                              PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #62 Dwight Way / Piedmont Avenue / Warring Street
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.417
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       13.1
Optimal Cycle:       61              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0   29    29    29   29     0    24   24    24    24    0    24
Lanes:        0  0  1  1  0    0  1  1  0  0    1  0  1  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  527     1     8  353     0   132  162   307    53    0   112
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  527     1     8  353     0   132  162   307    53    0   112
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:     0  579     1     9  388     0   145  178   337    58    0   123
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  579     1     9  388     0   145  178   337    58    0   123
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  579     1     9  388     0   145  178   337    58    0   123
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.95  0.90 0.90  1.00  0.68 1.00  0.85  0.79 1.00  0.79
Lanes:       0.00 1.99  0.01  0.04 1.96  0.00  1.00 1.00  1.00  0.32 0.00  0.68
Final Sat.:     0 3603     7    75 3329     0  1288 1900  1615   482    0  1018
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.16  0.16  0.12 0.12  0.00  0.11 0.09  0.21  0.12 0.00  0.12
Crit Moves:       ****                                    ****
Green/Cycle: 0.00 0.46  0.46  0.46 0.46  0.00  0.41 0.41  0.41  0.41 0.00  0.41
Volume/Cap:  0.00 0.35  0.35  0.25 0.25  0.00  0.27 0.23  0.50  0.29 0.00  0.29
Delay/Veh:    0.0 12.1  12.1  11.5 11.5   0.0  13.8 13.4  15.8  13.9  0.0  13.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 12.1  12.1  11.5 11.5   0.0  13.8 13.4  15.8  13.9  0.0  13.9
DesignQueue:    0   12     0     0    8     0     3    4     8     1    0     3
********************************************************************************
```

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #63 Dwight Avenue / Prospect Street

Average Delay (sec/veh): 6.1 Worst Case Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			0 0 1! 0 0			0 1 0 0 0			0 0 0 1 0		

Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM

Base Vol:	0	0	0	27	0	165	187	128	0	0	93	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	27	0	165	187	128	0	0	93	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
PHF Volume:	0	0	0	32	0	194	220	151	0	0	109	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	32	0	194	220	151	0	0	109	19

Critical Gap Module:

Critical Gp:	xxxxx	xxxx	xxxxx	6.4	xxxx	6.2	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx

Capacity Module:

Cnflict Vol:	xxxx	xxxx	xxxxx	709	xxxx	119	128	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	403	xxxx	938	1470	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	351	xxxx	938	1470	xxxx	xxxxx	xxxx	xxxx	xxxxx

Level Of Service Module:

Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	759	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	11.7	xxxxx	7.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	B	*	A	*	*	*	*	*
ApproachDel:		xxxxxx			11.7			xxxxxx			xxxxxx	
ApproachLOS:		*			B			*			*	

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #64 Adeline Street / Ward Avenue / Shattuck Avenue

Cycle (sec): 90 Critical Vol./Cap. (X): 0.907
Loss Time (sec): 8 (Y+R = 6 sec) Average Delay (sec/veh): 24.4
Optimal Cycle: 99 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	25	25	0	25	25	19	0	19	0	0	0
Lanes:	0 0 0 1 0			0 0 2 0 1			2 0 0 0 1			0 0 0 0 1		

Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM

Base Vol:	0	690	5	0	957	825	903	0	2	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	690	5	0	957	825	903	0	2	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	742	5	0	1029	887	971	0	2	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	742	5	0	1029	887	971	0	2	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	742	5	0	1029	887	971	0	2	0	0	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	0.95	0.85	0.92	1.00	0.85	1.00	1.00	1.00
Lanes:	0.00	0.99	0.01	0.00	2.00	1.00	2.00	0.00	1.00	0.00	0.00	1.00
Final Sat.:	0	1884	14	0	3610	1615	3502	0	1615	0	0	1900

Capacity Analysis Module:

Vol/Sat:	0.00	0.39	0.39	0.00	0.29	0.55	0.28	0.00	0.00	0.00	0.00	0.00
Crit Moves:						****	****					
Green/Cycle:	0.00	0.61	0.61	0.00	0.61	0.61	0.31	0.00	0.31	0.00	0.00	0.00
Volume/Cap:	0.00	0.65	0.65	0.00	0.47	0.91	0.91	0.00	0.00	0.00	0.00	0.00
Delay/Veh:	0.0	14.4	14.4	0.0	10.5	29.1	42.7	0.0	21.7	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	14.4	14.4	0.0	10.5	29.1	42.7	0.0	21.7	0.0	0.0	0.0
DesignQueue:	0	16	0	0	22	19	36	0	0	0	0	0

```
-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM 4-Way Stop Method (Base Volume Alternative)
*******************************************************************************
Intersection #65 Derby Street / Warring Street
*******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        1.399
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       185.8
Optimal Cycle:        0              Level Of Service:                  F
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0    0   765    0   30     7   62    0     0   75  780
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0    0    0   765    0   30     7   62    0     0   75  780
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95
PHF Volume:     0    0    0   805    0   32     7   65    0     0   79  821
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0    0    0   805    0   32     7   65    0     0   79  821
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:     0    0    0   805    0   32     7   65    0     0   79  821
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.00 0.00 0.00  0.96 0.00 0.04  0.10 0.90 0.00  0.00 0.09 0.91
Final Sat.:     0    0    0   576    0   23    53  471    0     0   59  613
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx xxxx  1.40 xxxx 1.40  0.14 0.14 xxxx  xxxx 1.34 1.34
Crit Moves:                  ****                 ****                 ****
Delay/Veh:    0.0  0.0  0.0 207.6  0.0 207.6 11.0 11.0  0.0   0.0  180 179.7
Delay Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   0.0  0.0  0.0 207.6  0.0 207.6 11.0 11.0  0.0   0.0  180 179.7
LOS by Move:    *    *    *     F    *    F     B    B    *     *    F    F
ApproachDel:     xxxxxx          207.6             11.0             179.7
Delay Adj:        xxxxx           1.00             1.00              1.00
ApprAdjDel:      xxxxxx          207.6             11.0             179.7
LOS by Appr:        *               F                B                 F
*******************************************************************************
```



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-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #66 Derby Street / Claremont Blvd.
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.718
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):        15.8
Optimal Cycle:       61              Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18    0   18     0    0    0     0   35   35    35   35    0
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       4    0  225     0    0    0     0  872   11    31  741    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    4    0  225     0    0    0     0  872   11    31  741    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96
PHF Volume:     4    0  234     0    0    0     0  908   11    32  772    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    4    0  234     0    0    0     0  908   11    32  772    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:     4    0  234     0    0    0     0  908   11    32  772    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.86 1.00 0.87  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.02 0.00 0.98  0.00 0.00 0.00  0.00 0.99 0.01  0.04 0.96 0.00
Final Sat.:    29    0 1618     0    0    0     0 1873   24    76 1824    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.14 0.00 0.14  0.00 0.00 0.00  0.00 0.49 0.49  0.42 0.42 0.00
Crit Moves:  ****                                 ****
Green/Cycle: 0.28 0.00 0.28  0.00 0.00 0.00  0.00 0.60 0.60  0.60 0.60 0.00
Volume/Cap:  0.52 0.00 0.52  0.00 0.00 0.00  0.00 0.81 0.81  0.71 0.71 0.00
Delay/Veh:   24.1  0.0 24.1   0.0  0.0  0.0   0.0 16.3 16.3  12.7 12.7  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  24.1  0.0 24.1   0.0  0.0  0.0   0.0 16.3 16.3  12.7 12.7  0.0
DesignQueue:    0    0    6     0    0    0     0   15    0     1   12    0
*******************************************************************************
```

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------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #67 Ashby Avenue / Seventh Street
********************************************************************************
Cycle (sec):        110              Critical Vol./Cap. (X):        0.958
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       51.8
Optimal Cycle:      155              Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    19   19    19    19   19    19    22   22    22    20   20    20
Lanes:        0  1  0  1  0    0  1  0  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     134  404    68   107  270   476   263  546   113    98  774    31
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  134  404    68   107  270   476   263  546   113    98  774    31
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:   140  421    71   111  281   496   274  569   118   102  806    32
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  140  421    71   111  281   496   274  569   118   102  806    32
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   140  421    71   111  281   496   274  569   118   102  806    32
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.51 0.51  0.51  0.62 0.62  0.62  0.95 0.93  0.93  0.95 0.94  0.94
Lanes:       0.44 1.34  0.22  0.28 0.72  1.00  1.00 1.66  0.34  1.00 1.92  0.08
Final Sat.:   427 1287   217   332  837  1169  1805 2913   603  1805 3450   138
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.33 0.33  0.33  0.34 0.34  0.42  0.15 0.20  0.20  0.06 0.23  0.23
Crit Moves:                              ****        ****                  ****
Green/Cycle: 0.44 0.44  0.44  0.44 0.44  0.44  0.20 0.20  0.20  0.24 0.24  0.24
Volume/Cap:  0.74 0.74  0.74  0.76 0.76  0.96  0.74 0.96  0.96  0.23 0.96  0.96
Delay/Veh:   31.0 31.0  31.0  30.3 30.3  50.5  56.0 70.3  70.3  35.4 63.8  63.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  31.0 31.0  31.0  30.3 30.3  50.5  56.0 70.3  70.3  35.4 63.8  63.8
DesignQueue:    5   15     3     4   10    18    14   29     6     5   39     2
********************************************************************************
```



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------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #68 Ashby Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):        110              Critical Vol./Cap. (X):        0.739
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       31.4
Optimal Cycle:       55              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected         Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     4   17    17     4   19    19    18   18    18    18   18    18
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     162  999    79   185  873   113    86  592   170    20  612   143
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  162  999    79   185  873   113    86  592   170    20  612   143
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:   172 1063    84   197  929   120    91  630   181    21  651   152
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  172 1063    84   197  929   120    91  630   181    21  651   152
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   172 1063    84   197  929   120    91  630   181    21  651   152
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.19 0.92  0.92  0.85 0.85  0.85
Lanes:       1.00 1.85  0.15  1.00 1.77  0.23  1.00 1.55  0.45  0.05 1.58  0.37
Final Sat.:  1805 3309   262  1805 3142   407   363 2712   779    83 2555   597
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.32  0.32  0.11 0.30  0.30  0.25 0.23  0.23  0.25 0.25  0.25
Crit Moves:       ****        ****                                         ****
Green/Cycle: 0.14 0.43  0.43  0.15 0.44  0.44  0.34 0.34  0.34  0.34 0.34  0.34
Volume/Cap:  0.67 0.74  0.74  0.74 0.67  0.67  0.73 0.67  0.67  0.74 0.74  0.74
Delay/Veh:   51.5 27.8  27.8  55.3 25.6  25.6  49.5 30.7  30.7  32.7 32.7  32.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  51.5 27.8  27.8  55.3 25.6  25.6  49.5 30.7  30.7  32.7 32.7  32.7
DesignQueue:    9   39     3    10   34     4     4   26     8     1   27     6
********************************************************************************
```

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-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #69 Ashby Avenue / Adeline Street
*******************************************************************************
Cycle (sec):        140              Critical Vol./Cap. (X):        0.522
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       36.7
Optimal Cycle:       86              Level Of Service:                 D
*******************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     4   32    32     6   38    38     4   22    22     4   32    32
Lanes:        1  0  1  1  0    1  0  2  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      92  693    85    31  700   169   135  491    39    68  547    39
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   92  693    85    31  700   169   135  491    39    68  547    39
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    98  737    90    33  745   180   144  522    41    72  582    41
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   98  737    90    33  745   180   144  522    41    72  582    41
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    98  737    90    33  745   180   144  522    41    72  582    41
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.88  0.88  0.95 0.94  0.94  0.95 0.94  0.94
Lanes:       1.00 1.78  0.22  1.00 2.42  0.58  1.00 1.85  0.15  1.00 1.87  0.13
Final Sat.:  1805 3164   388  1805 4057   979  1805 3308   263  1805 3336   238
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.23  0.23  0.02 0.18  0.18  0.08 0.16  0.16  0.04 0.17  0.17
Crit Moves:  ****                   ****       ****                   ****
Green/Cycle: 0.10 0.41  0.41  0.04 0.35  0.35  0.15 0.39  0.39  0.10 0.33  0.33
Volume/Cap:  0.52 0.56  0.56  0.43 0.52  0.52  0.52 0.41  0.41  0.41 0.52  0.52
Delay/Veh:   62.1 32.0  32.0  69.1 36.3  36.3  60.8 28.4  28.4  67.2 36.4  36.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  62.1 32.0  32.0  69.1 36.3  36.3  60.8 28.4  28.4  67.2 36.4  36.4
DesignQueue:    7   35     4     2   39     9    10   26     2     5   31     2
*******************************************************************************
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-------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #70 Ashby Avenue / Shattuck Avenue
*******************************************************************************
Cycle (sec):         80              Critical Vol./Cap. (X):        0.746
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       30.1
Optimal Cycle:       62              Level Of Service:                 C
*******************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    21   21    21     6   21    21    20   20    20    20   20    20
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      52  556    30   200  585    56    33  536    40    32  541   176
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   52  556    30   200  585    56    33  536    40    32  541   176
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    54  579    31   208  609    58    34  558    42    33  564   183
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   54  579    31   208  609    58    34  558    42    33  564   183
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    54  579    31   208  609    58    34  558    42    33  564   183
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.68 0.68  0.68  0.58 0.58  0.58  0.90 0.90  0.90  0.88 0.88  0.88
Lanes:       0.16 1.75  0.09  0.48 1.39  0.13  0.11 1.76  0.13  0.09 1.44  0.47
Final Sat.:   211 2256   122   521 1524   146   185 3004   224   142 2403   782
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.26 0.26  0.26  0.40 0.40  0.40  0.19 0.19  0.19  0.23 0.23  0.23
Crit Moves:                         ****                              ****
Green/Cycle: 0.33 0.33  0.33  0.41 0.41  0.41  0.44 0.44  0.44  0.44 0.44  0.44
Volume/Cap:  0.79 0.79  0.79  0.98 0.98  0.98  0.42 0.42  0.42  0.53 0.53  0.53
Delay/Veh:   32.0 32.0  32.0  50.1 50.1  50.1  16.1 16.1  16.1  17.5 17.5  17.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  32.0 32.0  32.0  50.1 50.1  50.1  16.1 16.1  16.1  17.5 17.5  17.5
DesignQueue:    2   18     1     6   17     2     1   14     1     1   15     5
*******************************************************************************
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LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #71 Ashby Avenue / Telegraph Avenue

Cycle (sec):	80	Critical Vol./Cap. (X):	0.925
Loss Time (sec):	12 (Y+R = 6 sec)	Average Delay (sec/veh):	25.6
Optimal Cycle:	104	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Prot+Permit			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	21	21	21	6	21	21	25	25	25	25	25	25
Lanes:	1 0 1 1 0			1 0 1 1 0			1 0 1 1 0			1 0 1 1 0		
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	210	675	75	176	902	63	68	531	184	148	642	99
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	210	675	75	176	902	63	68	531	184	148	642	99
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	223	718	80	187	960	67	72	565	196	157	683	105
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	223	718	80	187	960	67	72	565	196	157	683	105
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	223	718	80	187	960	67	72	565	196	157	683	105
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.57	0.94	0.94	0.95	0.91	0.91	0.95	0.93	0.93
Lanes:	1.00	1.80	0.20	1.00	1.87	0.13	1.00	1.49	0.51	1.00	1.73	0.27
Final Sat.:	1805	3200	356	1089	3341	233	1805	2576	893	1805	3065	473
Capacity Analysis Module:												
Vol/Sat:	0.12	0.22	0.22	0.17	0.29	0.29	0.04	0.22	0.22	0.09	0.22	0.22
Crit Moves:	****				****			****		****		
Green/Cycle:	0.35	0.35	0.35	0.94	0.46	0.46	0.35	0.35	0.35	0.35	0.35	0.35
Volume/Cap:	0.35	0.64	0.64	0.18	0.63	0.63	0.11	0.63	0.63	0.25	0.64	0.64
Delay/Veh:	25.2	29.3	29.3	2.7	19.7	19.7	23.3	30.6	30.6	25.0	30.8	30.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.2	29.3	29.3	2.7	19.7	19.7	23.3	30.6	30.6	25.0	30.8	30.8
DesignQueue:	9	28	3	6	32	2	3	22	8	6	27	4

LBNL + UC Berkeley LRDP EIR
Existing Conditions
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #72 Ashby Avenue / College Avenue

Cycle (sec):	80	Critical Vol./Cap. (X):	0.960
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	28.9
Optimal Cycle:	126	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	18	18	18	18	18	18	30	30	30	30	30	30
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	75	293	68	159	279	58	15	683	87	10	466	151
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	75	293	68	159	279	58	15	683	87	10	466	151
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	78	305	71	166	291	60	16	711	91	10	485	157
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	78	305	71	166	291	60	16	711	91	10	485	157
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	78	305	71	166	291	60	16	711	91	10	485	157
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.82	0.82	0.82	0.65	0.65	0.65	0.97	0.97	0.97	0.95	0.95	0.95
Lanes:	0.17	0.67	0.16	0.32	0.56	0.12	0.02	0.87	0.11	0.02	0.74	0.24
Final Sat.:	269	1050	244	394	691	144	35	1606	205	29	1348	437
Capacity Analysis Module:												
Vol/Sat:	0.29	0.29	0.29	0.42	0.42	0.42	0.44	0.44	0.44	0.36	0.36	0.36
Crit Moves:					****			****				
Green/Cycle:	0.38	0.38	0.38	0.45	0.45	0.45	0.53	0.53	0.53	0.53	0.53	0.53
Volume/Cap:	0.78	0.78	0.78	0.93	0.93	0.93	0.84	0.84	0.84	0.69	0.69	0.69
Delay/Veh:	31.7	31.7	31.7	46.0	46.0	46.0	25.1	25.1	25.1	18.1	18.1	18.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	31.7	31.7	31.7	46.0	46.0	46.0	25.1	25.1	25.1	18.1	18.1	18.1
DesignQueue:	2	9	2	4	8	2	0	17	2	0	11	4

```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #73 Ashby Avenue / Claremont Avenue
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.658
Loss Time (sec):     12 (Y+R = 12 sec) Average Delay (sec/veh):       22.2
Optimal Cycle:       72              Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16    16   16    16    28   28    28    28   28    28
Lanes:        0  1  0  1  0    1  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      45  373   189   432  285    49    47  592     5    66  504   232
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   45  373   189   432  285    49    47  592     5    66  504   232
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97  0.97 0.97  0.97
PHF Volume:    46  385   195   445  294    51    48  610     5    68  520   239
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   46  385   195   445  294    51    48  610     5    68  520   239
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    46  385   195   445  294    51    48  610     5    68  520   239
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
Lanes:       0.15 1.23  0.62  1.69 1.12  0.19  0.15 1.84  0.01  0.16 1.26  0.58
Final Sat.:   268 2218  1124  3054 2015   346   263 3319    28   297 2269  1044
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17 0.17  0.17  0.15 0.15  0.15  0.18 0.18  0.18  0.23 0.23  0.23
Crit Moves:  ****              ****                                   ****
Green/Cycle: 0.22 0.22  0.22  0.22 0.22  0.22  0.39 0.39  0.39  0.39 0.39  0.39
Volume/Cap:  0.78 0.78  0.78  0.66 0.66  0.66  0.47 0.47  0.47  0.59 0.59  0.59
Delay/Veh:   31.3 31.3  31.3  26.8 26.8  26.8  15.2 15.2  15.2  16.5 16.5  16.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  31.3 31.3  31.3  26.8 26.8  26.8  15.2 15.2  15.2  16.5 16.5  16.5
DesignQueue:    1   12     6    14    9     2     1   15     0     2   13     6
*******************************************************************************
```



```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #74 Tunnel Road / SR 13
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.785
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       13.6
Optimal Cycle:       55              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include            Ovl
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  2  0  1    2  0  1  0  0    0  0  0  0  0    1  0  0  0  2
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0 1130   256   534 1095     0     0    0     0   128    0   155
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1130   256   534 1095     0     0    0     0   128    0   155
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0 1202   272   568 1165     0     0    0     0   136    0   165
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1202   272   568 1165     0     0    0     0   136    0   165
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1202   272   568 1165     0     0    0     0   136    0   165
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.85  0.92 1.00  1.00  1.00 1.00  1.00  0.95 1.00  0.75
Lanes:       0.00 2.00  1.00  2.00 1.00  0.00  0.00 0.00  0.00  1.00 0.00  2.00
Final Sat.:     0 3610  1615  3502 1900     0     0    0     0  1805    0  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.33  0.17  0.16 0.61  0.00  0.00 0.00  0.00  0.08 0.00  0.06
Crit Moves:  ****                   ****                          ****
Green/Cycle: 0.00 0.43  0.43  0.23 1.00  0.00  0.00 0.00  0.00  0.23 0.23  0.23
Volume/Cap:  0.00 0.78  0.39  0.71 0.61  0.00  0.00 0.00  0.00  0.33 0.00  0.25
Delay/Veh:    0.0 18.5  13.1  26.1  0.6   0.0   0.0  0.0   0.0  21.4  0.0  20.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 18.5  13.1  26.1  0.6   0.0   0.0  0.0   0.0  21.4  0.0  20.7
DesignQueue:    0   27     6    16    0     0     0    0     0     4    0     5
*******************************************************************************
```

```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #167 Piedmont Avenue/ Channing Way
*******************************************************************************
Average Delay (sec/veh):     68.2          Worst Case Level Of Service:       F
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 28 Jan 2004 << 5:00-6:00PM
Base Vol:      85  311    45    43  406    85    42   59    87    36  109    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   85  311    45    43  406    85    42   59    87    36  109    15
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:    94  346    50    48  451    94    47   66    97    40  121    17
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    94  346    50    48  451    94    47   66    97    40  121    17
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  546 xxxx xxxxx   396 xxxx xxxxx  1222 1178   498  1234 1201   371
Potent Cap.: 1034 xxxx xxxxx  1174 xxxx xxxxx   158  192   576   155  187   680
Move Cap.:   1034 xxxx xxxxx  1174 xxxx xxxxx    54  166   576    81  162   680
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  8.8 xxxx xxxxx   8.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  147 xxxxx  xxxx  140 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  281 xxxxx xxxxx  227 xxxxx
Shared LOS:     *    *     *     *    *     *     *    F     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx            281.2            226.9
ApproachLOS:        *                *                F                F
```



```
-------------------------------------------------------------------------------
                         LBNL + UC Berkeley LRDP EIR
                             Existing Conditions
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #1121 Hearst Avenue-Cyclotron Road/ Highland Place
*******************************************************************************
Average Delay (sec/veh):      0.7          Worst Case Level Of Service:       B
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        1  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 28 Jan 2004 << 5:00-6:00PM
Base Vol:       2    0     0     5    2    13    11   56     0     0  342    43
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    2    0     0     5    2    13    11   56     0     0  342    43
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:     2    0     0     6    2    14    12   62     0     0  380    48
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     2    0     0     6    2    14    12   62     0     0  380    48
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.1 xxxx xxxxx   7.1  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5 xxxx xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  499 xxxx xxxxx   491  491   404   428 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  485 xxxx xxxxx   491  481   651  1142 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    469 xxxx xxxxx   487  476   651  1142 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 12.7 xxxx xxxxx xxxxx xxxx xxxxx   8.2 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  581 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.4 xxxxx   8.2 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:      12.7             11.4            xxxxxx           xxxxxx
ApproachLOS:        B                B                *                *
```

```
--------------------------------------------------------------------------------
                          LBNL + UC Berkeley LRDP EIR
                              Existing Conditions
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #1122 Stadium Rim Road/ Canyon Road
********************************************************************************
Average Delay (sec/veh):      0.2           Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    0  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 18 Nov 2003 << 5:00-6:00PM
Base Vol:       0  265     3     0  251     0     0    0     0     6    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  265     3     0  251     0     0    0     0     6    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90  0.90 0.90  0.90
PHF Volume:     0  294     3     0  279     0     0    0     0     7    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  294     3     0  279     0     0    0     0     7    0     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   575 xxxx   296
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   483 xxxx   748
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   483 xxxx   748
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  509 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.2 xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    B     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             12.2
ApproachLOS:        *                *                *                B
```

2025 Baseline—A.M. Peak Hour

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Marin Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):        100                Critical Vol./Cap. (X):        1.016
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):        93.8
Optimal Cycle:      180                Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     102  363    59   106  891    15    38  672   235   147  768    90
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  102  363    59   106  891    15    38  672   235   147  768    90
Added Vol:      1   13     1     7  133     0     0   20     8     4    2     2
Future:       120  120    64    20  131    14    14   67    30    34  267    10
Initial Fut:  223  496   124   133 1155    29    52  759   273   185 1037   102
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   223  496   124   133 1155    29    52  759   273   185 1037   102
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  223  496   124   133 1155    29    52  759   273   185 1037   102
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   223  496   124   133 1155    29    52  759   273   185 1037   102
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.92  0.92  0.95 0.95  0.95  0.95 0.91  0.91  0.95 0.94  0.94
Lanes:       1.00 1.60  0.40  1.00 1.95  0.05  1.00 1.47  0.53  1.00 1.82  0.18
Final Sat.:  1805 2801   700  1805 3507    88  1805 2549   917  1805 3244   319
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.18  0.18  0.07 0.33  0.33  0.03 0.30  0.30  0.10 0.32  0.32
Crit Moves:  ****                  ****                  ****  ****
Green/Cycle: 0.12 0.36  0.36  0.12 0.36  0.36  0.17 0.21  0.21  0.15 0.31  0.31
Volume/Cap:  1.03 0.49  0.49  0.61 0.91  0.91  0.17 1.42  1.42  0.68 1.03  1.03
Delay/Veh:  113.1 25.2  25.2  47.0 40.7  40.7  35.7  236 235.7  47.3 69.9  69.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 113.1 25.2  25.2  47.0 40.7  40.7  35.7  236 235.7  47.3 69.9  69.9
DesignQueue:   11   18     5     7   45     1     2   36    13     9   43     4
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Marin Avenue / The Alameda
********************************************************************************
Cycle (sec):         65                Critical Vol./Cap. (X):        0.666
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        15.4
Optimal Cycle:       56                Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    25    25    25    25    25    25    23    23    23    23    23    23
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     173  189     7    38  279    23    33  494   291    20  420    48
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  173  189     7    38  279    23    33  494   291    20  420    48
Added Vol:      3    0     1     0    0     0     0   18     9     5    5     0
Future:       110    0    10    10  190    20     0   70    50    10  170    10
Initial Fut:  286  189    18    48  469    43    33  582   350    35  595    58
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   286  189    18    48  469    43    33  582   350    35  595    58
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  286  189    18    48  469    43    33  582   350    35  595    58
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   286  189    18    48  469    43    33  582   350    35  595    58
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.55 0.55  0.55  0.83 0.83  0.83  0.82 0.82  0.82  0.83 0.83  0.83
Lanes:       1.00 0.91  0.09  0.17 1.68  0.15  0.07 1.21  0.72  0.10 1.73  0.17
Final Sat.:  1037  947    90   269 2632   241   107 1889  1136   160 2712   264
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.28 0.20  0.20  0.18 0.18  0.18  0.31 0.31  0.31  0.22 0.22  0.22
Crit Moves:  ****                                    ****
Green/Cycle: 0.41 0.41  0.41  0.41 0.41  0.41  0.46 0.46  0.46  0.46 0.46  0.46
Volume/Cap:  0.67 0.48  0.48  0.43 0.43  0.43  0.67 0.67  0.67  0.47 0.47  0.47
Delay/Veh:   20.1 15.6  15.6  14.6 14.6  14.6  16.0 16.0  16.0  13.1 13.1  13.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  20.1 15.6  15.6  14.6 14.6  14.6  16.0 16.0  16.0  13.1 13.1  13.1
DesignQueue:    6    4     0     1   10     1     1   12     7     1   12     1
********************************************************************************
```

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------------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
          Cumulative (2020) + UCB LRDP Project + Increment to '25
                             AM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #3 Gilman Street / Sixth Street
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.688
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       16.5
Optimal Cycle:       46              Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   19   19    19   19   19    19   19   19    19   19   19    19
Lanes:       0  0  1! 0  0   0  1  0  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     122   24    56   11   45    28   21  416   114   47  430    20
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  122   24    56   11   45    28   21  416   114   47  430    20
Added Vol:      1    0     0    0    0     0    0    1    10    0    0     0
Future:        70    0    28    0   30     0    0   37    10   48   67     0
Initial Fut:  193   24    84   11   75    28   21  454   134   95  497    20
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   193   24    84   11   75    28   21  454   134   95  497    20
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  193   24    84   11   75    28   21  454   134   95  497    20
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   193   24    84   11   75    28   21  454   134   95  497    20
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.70 0.70  0.70 0.84 0.84  0.84 0.95 0.95  0.95 0.85 0.85  0.85
Lanes:       0.64 0.08  0.28 0.19 1.32  0.49 0.03 0.75  0.22 0.16 0.81  0.03
Final Sat.:   858  107   373  310 2111   788   62 1341   396  251 1314    53
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.22  0.22 0.04 0.04  0.04 0.34 0.34  0.34 0.38 0.38  0.38
Crit Moves:       ****                                              ****
Green/Cycle: 0.33 0.33  0.33 0.33 0.33  0.33 0.55 0.55  0.55 0.55 0.55  0.55
Volume/Cap:  0.69 0.69  0.69 0.11 0.11  0.11 0.62 0.62  0.62 0.69 0.69  0.69
Delay/Veh:   27.5 27.5  27.5 15.5 15.5  15.5 12.8 12.8  12.8 14.9 14.9  14.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  27.5 27.5  27.5 15.5 15.5  15.5 12.8 12.8  12.8 14.9 14.9  14.9
DesignQueue:    5    1     2    0    2     1    0    8     2    2    9     0
******************************************************************************
```



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------------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
          Cumulative (2020) + UCB LRDP Project + Increment to '25
                             AM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #4 Gilman Street / San Pablo Avenue
******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.891
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       44.8
Optimal Cycle:      105              Level Of Service:                  D
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    4   35    35    4   35    35   31   31    31   31   31    31
Lanes:       1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     113  401    25   74 1055   125   75  189    96   62  318    42
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  113  401    25   74 1055   125   75  189    96   62  318    42
Added Vol:      0   14     0    0  144     0    0    0     1    0    0     0
Future:        30  305    60   60   70    20   35   20    10   10   40    32
Initial Fut:  143  720    85  134 1269   145  110  209   107   72  358    74
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   143  720    85  134 1269   145  110  209   107   72  358    74
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  143  720    85  134 1269   145  110  209   107   72  358    74
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   143  720    85  134 1269   145  110  209   107   72  358    74
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.93  0.93 0.95 0.94  0.94 0.56 0.56  0.56 0.86 0.86  0.86
Lanes:       1.00 1.79  0.21 1.00 1.79  0.21 0.52 0.98  0.50 0.14 0.71  0.15
Final Sat.:  1805 3177   375 1805 3191   365  549 1043   534  235 1167   241
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.23  0.23 0.07 0.40  0.40 0.20 0.20  0.20 0.31 0.31  0.31
Crit Moves:  ****                  ****                             ****
Green/Cycle: 0.00 0.37  0.00 0.00 0.37  0.00 0.37 0.37  0.37 0.37 0.37  0.37
Volume/Cap:  xxxx 0.61  xxxx xxxx 1.07  xxxx 0.55 0.55  0.55 0.84 0.84  0.84
Delay/Veh:    0.0 27.8   0.0  0.0 79.0   0.0 28.0 28.0  28.0 42.5 42.5  42.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 27.8   0.0  0.0 79.0   0.0 28.0 28.0  28.0 42.5 42.5  42.5
DesignQueue:    8   27     5    8   49     9    4    8     4    3   14     3
******************************************************************************
```

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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #5 Rose Street / Shattuck Avenue
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.574
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):        9.9
Optimal Cycle:       52              Level Of Service:                  A
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   17   17    17    17   17    17    27   27    27    27   27    27
Lanes:       1  0  1  1  0    1  0  1  1  0    0  1  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     55  191    11   174  961    28    28  174    40    32  185    40
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  55  191    11   174  961    28    28  174    40    32  185    40
Added Vol:     0    1     0     4   10     0     0    0     0     0    0     0
Future:       40  140    20    10  170    10    10   10    20    20   10    10
Initial Fut:  95  332    31   188 1141    38    38  184    60    52  195    50
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   95  332    31   188 1141    38    38  184    60    52  195    50
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  95  332    31   188 1141    38    38  184    60    52  195    50
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   95  332    31   188 1141    38    38  184    60    52  195    50
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.18 0.94  0.94  0.53 0.95  0.95  0.91 0.91  0.85  0.89 0.89  0.89
Lanes:       1.00 1.83  0.17  1.00 1.94  0.06  0.17 0.83  1.00  0.17 0.66  0.17
Final Sat.:   333 3259   304  1015 3476   116   297 1438  1615   297 1114   286
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.29 0.10  0.10  0.19 0.33  0.33  0.13 0.13  0.04  0.18 0.18  0.18
Crit Moves:                        ****                                ****
Green/Cycle: 0.46 0.46  0.46  0.46 0.46  0.46  0.42 0.42  0.42  0.42 0.42  0.42
Volume/Cap:  0.62 0.22  0.22  0.40 0.71  0.71  0.31 0.31  0.09  0.42 0.42  0.42
Delay/Veh:   23.0  4.8   4.8   7.5  8.6   8.6  13.8 13.8  11.8  15.3 15.3  15.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  23.0  4.8   4.8   7.5  8.6   8.6  13.8 13.8  11.8  15.3 15.3  15.3
DesignQueue:    2    7     1     4   24     1     1    4     1     1    4     1
******************************************************************************
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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #6 Cedar Street / Martin Luther King Way
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.980
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       33.1
Optimal Cycle:      122              Level Of Service:                  C
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   20   20    20    20   20    20    20   20    20    20   20    20
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     33  292    44    35  617    26    14  276    62    58  248    30
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  33  292    44    35  617    26    14  276    62    58  248    30
Added Vol:     0    3     1     0   11     0     0   12     1     4    1     0
Future:       10   40    20    20  220    10    10   50    30    30   90    20
Initial Fut:  43  335    65    55  848    36    24  338    93    92  339    50
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   43  335    65    55  848    36    24  338    93    92  339    50
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  43  335    65    55  848    36    24  338    93    92  339    50
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   43  335    65    55  848    36    24  338    93    92  339    50
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.86 0.86  0.86  0.95 0.95  0.95  0.94 0.94  0.94  0.75 0.75  0.75
Lanes:       0.10 0.75  0.15  0.06 0.90  0.04  0.05 0.75  0.20  0.19 0.71  0.10
Final Sat.:   158 1229   239   106 1629    69    94 1327   365   272 1001   148
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.27 0.27  0.27  0.52 0.52  0.52  0.25 0.25  0.25  0.34 0.34  0.34
Crit Moves:                        ****                                ****
Green/Cycle: 0.53 0.53  0.53  0.53 0.53  0.53  0.35 0.35  0.35  0.35 0.35  0.35
Volume/Cap:  0.51 0.51  0.51  0.98 0.98  0.98  0.74 0.74  0.74  0.98 0.98  0.98
Delay/Veh:    9.2  9.2   9.2  35.3 35.3  35.3  26.4 26.4  26.4  57.0 57.0  57.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   9.2  9.2   9.2  35.3 35.3  35.3  26.4 26.4  26.4  57.0 57.0  57.0
DesignQueue:    1    6     1     1   17     1     1    9     2     2    9     1
******************************************************************************
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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #7 Cedar Street / Shattuck Avenue
*******************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):        0.626
Loss Time (sec):       8 (Y+R =  5 sec) Average Delay (sec/veh):       10.5
Optimal Cycle:        50               Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   20   20    20   20   20    20   22   22    22   22   22    22
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     48  256    41  127  933    52   44  257    86   94  268    56
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  48  256    41  127  933    52   44  257    86   94  268    56
Added Vol:     0    1     0    2    8     0    0   12     0    4    6     0
Future:       20  140    20   10  150    10   10   30    10   40   70    20
Initial Fut:  68  397    61  139 1091    62   54  299    96  138  344    76
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   68  397    61  139 1091    62   54  299    96  138  344    76
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  68  397    61  139 1091    62   54  299    96  138  344    76
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   68  397    61  139 1091    62   54  299    96  138  344    76
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.22 0.93  0.93 0.48 0.94  0.94 0.33 0.96  0.96 0.36 0.97  0.97
Lanes:       1.00 1.73  0.27 1.00 1.89  0.11 1.00 0.76  0.24 1.00 0.82  0.18
Final Sat.:   424 3067   471  920 3389   193  621 1386   445  678 1514   335
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.13  0.13 0.15 0.32  0.32 0.09 0.22  0.22 0.20 0.23  0.23
Crit Moves:                       ****                             ****
Green/Cycle: 0.51 0.51  0.51 0.51 0.51  0.51 0.36 0.36  0.36 0.36 0.36  0.36
Volume/Cap:  0.31 0.25  0.25 0.29 0.63  0.63 0.24 0.59  0.59 0.56 0.63  0.63
Delay/Veh:    6.4  2.9   2.9  4.2  5.0   5.0 17.0 20.7  20.7 25.5 21.5  21.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   6.4  2.9   2.9  4.2  5.0   5.0 17.0 20.7  20.7 25.5 21.5  21.5
DesignQueue:    1    7     1    2   21     1    1    7     2    3    8     2
*******************************************************************************
```



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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #8 Cedar Street / Oxford Street
*******************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):        1.028
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       57.7
Optimal Cycle:       175               Level Of Service:                 E
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16    16   16   16    16   16   16    16   16   16    16
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     45  186    56   34  531    19   18  314    75  144  343    19
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  45  186    56   34  531    19   18  314    75  144  343    19
Added Vol:     2   13     0    0  115     9    1    0    14    0    0     0
Future:       30   20    10   10   10     0   10   40    30   10  120     0
Initial Fut:  77  219    66   44  656    28   29  354   119  154  463    19
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   77  219    66   44  656    28   29  354   119  154  463    19
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  77  219    66   44  656    28   29  354   119  154  463    19
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   77  219    66   44  656    28   29  354   119  154  463    19
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.76 0.76  0.76 0.96 0.96  0.96 0.92 0.92  0.92 0.67 0.67  0.67
Lanes:       0.21 0.61  0.18 0.06 0.90  0.04 0.06 0.70  0.24 0.24 0.73  0.03
Final Sat.:   306  871   262  110 1639    70  101 1239   416  307  923    38
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.25 0.25  0.25 0.40 0.40  0.40 0.29 0.29  0.29 0.50 0.50  0.50
Crit Moves:                       ****                             ****
Green/Cycle: 0.50 0.49  0.49 0.50 0.50  0.50 0.40 0.39  0.39 0.40 0.40  0.40
Volume/Cap:  0.50 0.51  0.51 0.80 0.80  0.80 0.72 0.74  0.74 1.27 1.27  1.27
Delay/Veh:   10.8 11.5  11.5 17.7 17.7  17.7 23.1 24.4  24.4 156.2 156 156.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  10.8 11.5  11.5 17.7 17.7  17.7 23.1 24.4  24.4 156.2 156 156.2
DesignQueue:    1    4     1    1   13     1    1    8     3    4   11     0
*******************************************************************************
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365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Cedar Street / Euclid Avenue

Cycle (sec):	60	Critical Vol./Cap. (X):	0.599
Loss Time (sec):	8 (Y+R = 5 sec)	Average Delay (sec/veh):	13.8
Optimal Cycle:	42	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	17	17	17	17	17	17	17	17	17	17	17	17
Lanes:		0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0	
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	30	85	29	23	295	141	50	143	117	28	209	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	30	85	29	23	295	141	50	143	117	28	209	8
Added Vol:	0	0	0	0	11	3	0	-2	0	0	0	0
Future:	20	0	0	0	10	40	10	30	20	20	80	0
Initial Fut:	50	85	29	23	316	184	60	171	137	48	289	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	50	85	29	23	316	184	60	171	137	48	289	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	50	85	29	23	316	184	60	171	137	48	289	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	50	85	29	23	316	184	60	171	137	48	289	8
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.78	0.78	0.78	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Lanes:	0.30	0.52	0.18	0.04	0.61	0.35	0.16	0.47	0.37	0.14	0.84	0.02
Final Sat.:	452	769	262	78	1076	627	266	759	608	242	1457	40
Capacity Analysis Module:												
Vol/Sat:	0.11	0.11	0.11	0.29	0.29	0.29	0.23	0.23	0.23	0.20	0.20	0.20
Crit Moves:					****			****				
Green/Cycle:	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Volume/Cap:	0.23	0.23	0.23	0.60	0.60	0.60	0.60	0.60	0.60	0.53	0.53	0.53
Delay/Veh:	8.9	8.9	8.9	12.2	12.2	12.2	16.7	16.7	16.7	15.4	15.4	15.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.9	8.9	8.9	12.2	12.2	12.2	16.7	16.7	16.7	15.4	15.4	15.4
DesignQueue:	1	1	1	0	6	3	1	4	3	1	6	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #10 Grizzly Peak Blvd / Centennial Drive

Cycle (sec):	100	Critical Vol./Cap. (X):	0.472
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	11.1
Optimal Cycle:	0	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Stop Sign			Stop Sign			Stop Sign			Stop Sign	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0	
Volume Module: >> Count Date: 4 Dec 2002 << 7:00-9:00 AM												
Base Vol:	31	13	13	25	52	4	6	165	143	169	90	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	31	13	13	25	52	4	6	165	143	169	90	16
Added Vol:	0	0	3	0	0	0	0	0	0	28	0	0
Future:	33	0	11	0	0	0	0	22	11	22	11	0
Initial Fut:	64	13	27	25	52	4	6	187	154	219	101	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	64	13	27	25	52	4	6	187	154	219	101	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	64	13	27	25	52	4	6	187	154	219	101	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	64	13	27	25	52	4	6	187	154	219	101	16
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.62	0.12	0.26	0.31	0.64	0.05	0.02	0.54	0.44	0.65	0.30	0.05
Final Sat.:	360	73	152	175	365	28	13	411	339	464	214	34
Capacity Analysis Module:												
Vol/Sat:	0.18	0.18	0.18	0.14	0.14	0.14	0.45	0.45	0.45	0.47	0.47	0.47
Crit Moves:		****			****			****				****
Delay/Veh:	9.6	9.6	9.6	9.5	9.5	9.5	11.1	11.1	11.1	12.0	12.0	12.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.6	9.6	9.6	9.5	9.5	9.5	11.1	11.1	11.1	12.0	12.0	12.0
LOS by Move:	A	A	A	A	A	A	B	B	B	B	B	B
ApproachDel:		9.6			9.5			11.1			12.0	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.6			9.5			11.1			12.0	
LOS by Appr:		A			A			B			B	

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Hearst Avenue / Shattuck Avenue

Cycle (sec): 65 Critical Vol./Cap. (X): 0.531
Loss Time (sec): 8 (Y+R = 6 sec) Average Delay (sec/veh): 8.2
Optimal Cycle: 52 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	22	22	22	22	22	22	22	22	22	22	22	22
Lanes:	1 0	1	1 0	1 0	1	1 0	0 1	0	1 0	0 1	0	1 0
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	19	291	43	199	810	57	31	278	24	11	225	51
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	19	291	43	199	810	57	31	278	24	11	225	51
Added Vol:	3	1	-13	2	11	0	0	34	25	0	4	0
Future:	11	99	22	55	176	22	33	33	33	11	22	77
Initial Fut:	33	391	52	256	997	79	64	345	82	22	251	128
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	33	391	52	256	997	79	64	345	82	22	251	128
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	33	391	52	256	997	79	64	345	82	22	251	128
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	33	391	52	256	997	79	64	345	82	22	251	128
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.26	0.93	0.93	0.49	0.94	0.94	0.79	0.79	0.79	0.83	0.83	0.83
Lanes:	1.00	1.77	0.23	1.00	1.85	0.15	0.26	1.41	0.33	0.11	1.25	0.64
Final Sat.:	500	3129	416	935	3308	262	389	2097	498	172	1964	1002
Capacity Analysis Module:												
Vol/Sat:	0.07	0.12	0.12	0.27	0.30	0.30	0.16	0.16	0.16	0.13	0.13	0.13
Crit Moves:					****			****				
Green/Cycle:	0.54	0.54	0.54	0.54	0.54	0.54	0.34	0.34	0.34	0.34	0.34	0.34
Volume/Cap:	0.12	0.23	0.23	0.51	0.56	0.56	0.49	0.49	0.49	0.38	0.38	0.38
Delay/Veh:	2.6	2.0	2.0	5.8	3.4	3.4	18.7	18.7	18.7	17.3	17.3	17.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	2.6	2.0	2.0	5.8	3.4	3.4	18.7	18.7	18.7	17.3	17.3	17.3
DesignQueue:	1	7	1	4	18	1	2	9	2	1	6	3

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #12 Hearst Avenue / Oxford Avenue

Cycle (sec): 65 Critical Vol./Cap. (X): 0.557
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 11.7
Optimal Cycle: 49 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	19	19	19	19	19	19	22	22	22	22	22	22
Lanes:	1 0	1	1 0	0 1	0	1 0	0 1	0	1 0	1 1	0	1 0
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	46	328	374	48	841	38	10	399	114	207	281	27
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	46	328	374	48	841	38	10	399	114	207	281	27
Added Vol:	0	59	18	2	99	3	19	5	-1	4	1	19
Future:	22	55	44	11	33	22	0	88	33	33	77	11
Initial Fut:	68	442	436	61	973	63	29	492	146	244	359	57
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	68	442	436	61	973	63	29	492	146	244	359	57
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	68	442	436	61	973	63	29	492	146	244	359	57
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	68	442	436	61	973	63	29	492	146	244	359	57
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Lanes:	1.00	1.01	0.99	0.11	1.78	0.11	0.09	1.47	0.44	1.11	1.63	0.26
Final Sat.:	1900	1817	1793	201	3202	207	157	2663	790	2002	2945	468
Capacity Analysis Module:												
Vol/Sat:	0.04	0.24	0.24	0.30	0.30	0.30	0.18	0.18	0.18	0.12	0.12	0.12
Crit Moves:					****			****				
Green/Cycle:	0.54	0.54	0.54	0.54	0.54	0.54	0.34	0.34	0.34	0.34	0.34	0.34
Volume/Cap:	0.07	0.45	0.45	0.56	0.56	0.56	0.55	0.55	0.55	0.36	0.36	0.36
Delay/Veh:	5.2	7.2	7.2	8.2	8.2	8.2	19.2	19.2	19.2	16.7	16.7	16.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	5.2	7.2	7.2	8.2	8.2	8.2	19.2	19.2	19.2	16.7	16.7	16.7
DesignQueue:	1	8	8	1	18	1	1	12	4	6	9	1

```
--------------------------------------------------------------------------------
                               365330 LBNL LRDP EIR
             Cumulative (2020) + UCB LRDP Project + Increment to '25
                                   AM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Hearst Avenue / Spruce Street
********************************************************************************
Average Delay (sec/veh):       0.7           Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  1  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:        0    0     0     9    0    63    11  843     0     0  430     7
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0     9    0    63    11  843     0     0  430     7
Added Vol:       0    0     0     0    0     0     0   25     0     0   24     0
Future:          0    0     0     0    0    20     0  130     0     0  110     0
Initial Fut:     0    0     0     9    0    83    11  998     0     0  564     7
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0     9    0    83    11  998     0     0  564     7
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0     9    0    83    11  998     0     0  564     7
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1089 xxxx   286   571 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   213 xxxx   717  1012 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   212 xxxx   717  1012 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.6 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  581 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 12.4 xxxxx   8.6 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            12.4             xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```



```
--------------------------------------------------------------------------------
                               365330 LBNL LRDP EIR
             Cumulative (2020) + UCB LRDP Project + Increment to '25
                                   AM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #14 Hearst Avenue / Arch Street / Le Conte Avenue
********************************************************************************
Average Delay (sec/veh):       3.2           Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:        0    0     0     2    0   130   276  566     0     0  307     4
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0     2    0   130   276  566     0     0  307     4
Added Vol:       0    0     0     0    0     0    24    1     0     0   24     0
Future:          0    0     0     0    0    40    30  100     0     0   90     0
Initial Fut:     0    0     0     2    0   170   330  667     0     0  421     4
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0     2    0   170   330  667     0     0  421     4
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0     2    0   170   330  667     0     0  421     4
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1417 xxxx   213   425 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   130 xxxx   799  1145 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   101 xxxx   799  1145 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.4 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  740 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            11.3             xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #15 Hearst Avenue / Scenic Avenue

Average Delay (sec/veh): 0.5   Worst Case Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			0 0 0 0 1			0 0 2 0 0			0 0 1 1 0		
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM												
Base Vol:	0	0	0	0	0	37	0	531	0	0	290	55
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	37	0	531	0	0	290	55
Added Vol:	0	0	0	0	0	1	0	0	0	0	22	2
Future:	0	0	0	0	0	20	0	100	0	0	90	10
Initial Fut:	0	0	0	0	0	58	0	631	0	0	402	67
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	58	0	631	0	0	402	67
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	58	0	631	0	0	402	67
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	6.9	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	235	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	773	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	773	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	10.0	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	B	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			10.0			xxxxxx			xxxxxx		
ApproachLOS:	*			B			*			*		

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Hearst Avenue / Euclid Avenue

Cycle (sec): 65   Critical Vol./Cap. (X): 0.563
Loss Time (sec): 12 (Y+R = 3 sec)   Average Delay (sec/veh): 17.1
Optimal Cycle: 53   Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	25	25	25	5	16	16	16	16	16
Lanes:	0 0 1! 0 0			0 0 1! 0 0			1 0 0 1 0			0 0 1! 0 0		
Volume Module: >> Count Date: 12 Nov 2002 << 7:00-9:00 AM												
Base Vol:	2	0	2	47	1	151	75	448	1	1	276	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	0	2	47	1	151	75	448	1	1	276	10
Added Vol:	0	0	0	3	0	3	0	1	0	0	30	0
Future:	0	0	0	11	0	55	11	99	0	0	77	0
Initial Fut:	2	0	2	61	1	209	86	548	1	1	383	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	0	2	61	1	209	86	548	1	1	383	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	0	2	61	1	209	86	548	1	1	383	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	2	0	2	61	1	209	86	548	1	1	383	10
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.87	1.00	0.87	0.84	0.84	0.84	0.63	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.00	0.50	0.22	0.01	0.77	1.00	0.99	0.01	0.01	0.97	0.02
Final Sat.:	825	0	825	358	6	1226	1201	1897	3	5	1841	48
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.17	0.17	0.07	0.29	0.29	0.21	0.21	0.21
Crit Moves:					****			****				
Green/Cycle:	0.38	0.00	0.38	0.38	0.38	0.38	0.43	0.43	0.43	0.43	0.43	0.43
Volume/Cap:	0.01	0.00	0.01	0.44	0.44	0.44	0.17	0.67	0.67	0.48	0.48	0.48
Delay/Veh:	12.4	0.0	12.4	17.2	17.2	17.2	12.0	19.2	19.2	15.3	15.3	15.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.4	0.0	12.4	17.2	17.2	17.2	12.0	19.2	19.2	15.3	15.3	15.3
DesignQueue:	0	0	0	1	0	5	2	12	0	0	8	0

```
-----------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
-----------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*****************************************************************************
Intersection #17 Hearst Avenue / Le Roy Avenue
*****************************************************************************
Average Delay (sec/veh):      1.7           Worst Case Level Of Service:       B
*****************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:           Include          Include          Include           Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:        0    0     0    19    0    60    59  436     0     0  230     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0    19    0    60    59  436     0     0  230     3
Added Vol:       0    0     0     0    0     0     0    5     0     0   30     0
Future:          0    0     0     0    0    10    10   90     0     0   70     0
Initial Fut:     0    0     0    19    0    70    69  531     0     0  330     3
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0    19    0    70    69  531     0     0  330     3
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0    19    0    70    69  531     0     0  330     3
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   777 xxxx   332   333 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   288 xxxx   715  1238 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   275 xxxx   715  1238 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.1 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  533 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 13.1 xxxxx   8.1 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx             13.1            xxxxxx            xxxxxx
ApproachLOS:        *                 B                *                 *
```



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-----------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
-----------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #18 Hearst Avenue / Gayley Road / LaLoma Avenue
*****************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        1.159
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       57.3
Optimal Cycle:       180              Level Of Service:                  E
*****************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:           Include          Include           Include           Include
Min. Green:    18   18    18    18   18    18    17   17    17    17   17    17
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00-9:00 AM
Base Vol:      274  212    95    12  274    21    28  161   304    21   33     5
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   274  212    95    12  274    21    28  161   304    21   33     5
Added Vol:      30    3     0     0   38     0     0    0     5     0    0     0
Future:         77   11    22     0  132     0     0   88     0    22   22     0
Initial Fut:   381  226   117    12  444    21    28  249   309    43   55     5
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    381  226   117    12  444    21    28  249   309    43   55     5
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   381  226   117    12  444    21    28  249   309    43   55     5
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    381  226   117    12  444    21    28  249   309    43   55     5
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.56 0.56  0.56  0.98 0.98  0.98  0.91 0.91  0.91  0.75 0.75  0.85
Lanes:       0.53 0.31  0.16  0.03 0.93  0.04  0.05 0.42  0.53  0.44 0.56  1.00
Final Sat.:    561  333   172    47 1728    82    83  738   916   623  797  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.68 0.68  0.68  0.26 0.26  0.26  0.34 0.34  0.34  0.07 0.07  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.55 0.55  0.55  0.55 0.55  0.55  0.40 0.40  0.00  0.40 0.40  0.40
Volume/Cap:  1.23 1.23  1.23  0.46 0.46  0.46  0.84 0.84  xxxx  0.17 0.17  0.01
Delay/Veh:  130.5  131 130.5  10.2 10.2  10.2  27.7 27.7   0.0  11.9 11.9  10.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 130.5  131 130.5  10.2 10.2  10.2  27.7 27.7   0.0  11.9 11.9  10.5
DesignQueue:    7    4     2     0    8     0     1    6    12     1    1     0
*****************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #19 Berkeley Way / Oxford Street

Cycle (sec): 70 Critical Vol./Cap. (X): 0.516
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 7.0
Optimal Cycle: 46 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	18	18	18	18	18	18	20	20	20	20	20	20
Lanes:	1 0 1 1 0			1 0 1 1 0			0 0 1! 0 0			1 0 0 1 0		
Volume Module:												
Base Vol:	39	717	40	30	1132	11	20	18	72	10	2	12
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	39	717	40	30	1132	11	20	18	72	10	2	12
Added Vol:	38	74	0	0	76	26	3	0	4	0	0	0
PasserByVol:	10	110	10	0	100	0	0	0	20	0	0	0
Initial Fut:	87	901	50	30	1308	37	23	18	96	10	2	12
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	87	901	50	30	1308	37	23	18	96	10	2	12
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	87	901	50	30	1308	37	23	18	96	10	2	12
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	87	901	50	30	1308	37	23	18	96	10	2	12
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.17	0.94	0.94	0.29	0.95	0.95	0.87	0.87	0.87	0.85	0.87	0.87
Lanes:	1.00	1.89	0.11	1.00	1.94	0.06	0.17	0.13	0.70	1.00	0.14	0.86
Final Sat.:	315	3393	188	545	3497	99	277	217	1157	1621	236	1418
Capacity Analysis Module:												
Vol/Sat:	0.28	0.27	0.27	0.06	0.37	0.37	0.08	0.08	0.08	0.01	0.01	0.01
Crit Moves:					****			****				
Green/Cycle:	0.60	0.60	0.60	0.60	0.60	0.60	0.29	0.29	0.29	0.29	0.29	0.29
Volume/Cap:	0.46	0.44	0.44	0.09	0.62	0.62	0.29	0.29	0.29	0.02	0.03	0.03
Delay/Veh:	12.3	5.0	5.0	4.0	6.5	6.5	21.0	21.0	21.0	18.1	18.1	18.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.3	5.0	5.0	4.0	6.5	6.5	21.0	21.0	21.0	18.1	18.1	18.1
DesignQueue:	1	15	1	0	22	1	1	1	3	0	0	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #20 University Avenue / Sixth Street

Cycle (sec): 114 Critical Vol./Cap. (X): 0.993
Loss Time (sec): 16 (Y+R = 5 sec) Average Delay (sec/veh): 97.8
Optimal Cycle: 180 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	6	23	23	0	23	23	6	15	15	6	15	15
Lanes:	1 0 1 0 1			1 0 1 0 1			1 0 1 1 0			1 0 1 1 0		
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM												
Base Vol:	211	111	19	73	290	325	89	932	333	40	931	21
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	211	111	19	73	290	325	89	932	333	40	931	21
Added Vol:	0	17	12	0	4	1	6	276	0	1	28	0
Future:	150	60	10	10	10	80	10	60	40	10	150	10
Initial Fut:	361	188	41	83	304	406	105	1268	373	51	1109	31
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	361	188	41	83	304	406	105	1268	373	51	1109	31
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	361	188	41	83	304	406	105	1268	373	51	1109	31
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	361	188	41	83	304	406	105	1268	373	51	1109	31
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.98	1.00	0.85	1.00	1.00	0.85	0.95	0.92	0.92	0.95	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.55	0.45	1.00	1.95	0.05
Final Sat.:	1858	1900	1615	1900	1900	1615	1805	2695	793	1805	3498	98
Capacity Analysis Module:												
Vol/Sat:	0.19	0.10	0.03	0.04	0.16	0.25	0.06	0.47	0.47	0.03	0.32	0.32
Crit Moves:	****					****		****		****		
Green/Cycle:	0.44	0.44	0.44	0.25	0.25	0.25	0.06	0.37	0.37	0.05	0.35	0.35
Volume/Cap:	0.44	0.22	0.06	0.18	0.65	1.02	0.90	1.28	1.28	0.54	0.90	0.90
Delay/Veh:	47.8	20.4	18.5	34.8	45.6	94.7	111.4	170	170.0	72.7	44.8	44.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.8	20.4	18.5	34.8	45.6	94.7	111.4	170	170.0	72.7	44.8	44.8
DesignQueue:	19	7	1	4	15	21	6	57	17	3	49	1

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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #21 University Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):        114              Critical Vol./Cap. (X):        0.949
Loss Time (sec):     16 (Y+R =  5 sec) Average Delay (sec/veh):      127.2
Optimal Cycle:      154              Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     5   21    21     5   21    21     5   22    22     5   22    22
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     100  457    75   190  837    83    56  957    49    63  644    93
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  100  457    75   190  837    83    56  957    49    63  644    93
Added Vol:      0    3     7    62   50     0     0  287     1     1   29     8
Future:        50  200    40    60   30    20    10   60    10    10  120   100
Initial Fut:  150  660   122   312  917   103    66 1304    60    74  793   201
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   150  660   122   312  917   103    66 1304    60    74  793   201
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  150  660   122   312  917   103    66 1304    60    74  793   201
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   150  660   122   312  917   103    66 1304    60    74  793   201
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.94  0.94  0.95 0.94  0.94  0.95 0.92  0.92
Lanes:       1.00 1.69  0.31  1.00 1.80  0.20  1.00 1.91  0.09  1.00 1.60  0.40
Final Sat.:  1805 2977   550  1805 3197   359  1805 3427   158  1805 2794   708
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.22  0.22  0.17 0.29  0.29  0.04 0.38  0.38  0.04 0.28  0.28
Crit Moves:       ****        ****                  ****        ****
Green/Cycle: 0.13 0.28  0.28  0.29 0.44  0.44  0.04 0.25  0.25  0.04 0.25  0.25
Volume/Cap:  0.65 0.79  0.79  0.60 0.65  0.65  0.83 1.52  1.52  0.93 1.14  1.14
Delay/Veh:   61.0 44.5  44.5  40.3 27.3  27.3 116.3  283 283.4 138.5  118 117.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  61.0 44.5  44.5  40.3 27.3  27.3 116.3  283 283.4 138.5  118 117.7
DesignQueue:    8   32     6    15   35     4     4   68     3     5   40    10
********************************************************************************
```



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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #22 University Avenue / Martin Luther King Way
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        1.008
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       37.4
Optimal Cycle:      173              Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     5   23    23    23   23    23    17   17    17    17   17    17
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     178  568    80    57  833    87    81  703   185    41  477    47
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  178  568    80    57  833    87    81  703   185    41  477    47
Added Vol:      1    3     3     0   14     0     2  357    -2     0   36     0
Future:        70    0     0     0  230    30    10  130    20    20  160    80
Initial Fut:  249  571    83    57 1077   117    93 1190   203    61  673   127
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   249  571    83    57 1077   117    93 1190   203    61  673   127
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  249  571    83    57 1077   117    93 1190   203    61  673   127
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   249  571    83    57 1077   117    93 1190   203    61  673   127
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.99 0.93  0.93  1.00 0.94  0.94  0.17 0.93  0.93  1.00 0.93  0.93
Lanes:       1.00 1.75  0.25  1.00 1.80  0.20  1.00 1.71  0.29  1.00 1.68  0.32
Final Sat.:  1880 3092   449  1900 3207   348   315 3016   515  1900 2964   559
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.18  0.18  0.03 0.34  0.34  0.29 0.39  0.39  0.03 0.23  0.23
Crit Moves:  ****                  ****              ****
Green/Cycle: 0.45 0.45  0.45  0.35 0.35  0.35  0.37 0.37  0.37  0.37 0.37  0.37
Volume/Cap:  0.30 0.41  0.41  0.08 0.95  0.95  0.80 1.07  1.07  0.09 0.61  0.61
Delay/Veh:   26.1 11.1  11.1  13.4 35.0  35.0  59.9 65.1  65.1  13.6 18.9  18.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.1 11.1  11.1  13.4 35.0  35.0  59.9 65.1  65.1  13.6 18.9  18.9
DesignQueue:    8   12     2     1   27     3     2   30     5     1   16     3
********************************************************************************
```

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-----------------------------------------------------------------------------
                      365330 LBNL LRDP EIR
         Cumulative (2020) + UCB LRDP Project + Increment to '25
                            AM Peak Hour
-----------------------------------------------------------------------------
                 Level Of Service Computation Report
         2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #23 University Avenue / Milvia Street
*****************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.664
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        13.9
Optimal Cycle:       49               Level Of Service:                  B
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   21   21    21   21   21    21   20   20    20   20   20    20
Lanes:       1  0  0  1  0   0  0  1! 0  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:    100   98    21    6  203    63   37  656   137   18  406    15
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 100   98    21    6  203    63   37  656   137   18  406    15
Added Vol:     0    0     0    0    0     0    0  360     0    0   36     0
Future:       10   10    10   10   10    10   20   80    20   20  240    20
Initial Fut: 110  108    31   16  213    73   57 1096   157   38  682    35
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  110  108    31   16  213    73   57 1096   157   38  682    35
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 110  108    31   16  213    73   57 1096   157   38  682    35
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  110  108    31   16  213    73   57 1096   157   38  682    35
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.73 0.97  0.97 0.95 0.95  0.95 0.83 0.83  0.83 0.80 0.80  0.80
Lanes:      1.00 0.78  0.22 0.05 0.71  0.24 0.09 1.67  0.24 0.10 1.81  0.09
Final Sat.: 1391 1428   410   96 1276   437  137 2637   378  153 2743   141
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.08 0.08  0.08 0.17 0.17  0.17 0.42 0.42  0.42 0.25 0.25  0.25
Crit Moves:                      ****             ****
Green/Cycle: 0.32 0.32  0.32 0.32 0.32  0.32 0.55 0.55  0.55 0.55 0.55  0.55
Volume/Cap: 0.24 0.23  0.23 0.52 0.52  0.52 0.75 0.75  0.75 0.45 0.45  0.45
Delay/Veh:  17.5 17.0  17.0 21.1 21.1  21.1 14.1 14.1  14.1  9.5  9.5   9.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 17.5 17.0  17.0 21.1 21.1  21.1 14.1 14.1  14.1  9.5  9.5   9.5
DesignQueue:    3    3     1    0    5     2    1   19     3    1   12     1
*****************************************************************************
```



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-----------------------------------------------------------------------------
                      365330 LBNL LRDP EIR
         Cumulative (2020) + UCB LRDP Project + Increment to '25
                            AM Peak Hour
-----------------------------------------------------------------------------
                 Level Of Service Computation Report
         2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #24 University Avenue / SB Shattuck Avenue
*****************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.672
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        35.7
Optimal Cycle:       43               Level Of Service:                  D
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0   16   16    16   16   16    16   16   16    16
Lanes:       0  0  0  0  0   0  1  1  1  0   1  0  1  1  0   0  1  0  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0     0   49  767   105  115  401   162   26  356   314
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0   49  767   105  115  401   162   26  356   314
Added Vol:     0    0     0    0    9     6   55  181   124    0   30    36
Future:        0    0     0   11  132    66   22   55    11   11  220    99
Initial Fut:   0    0     0   60  908   177  192  637   297   37  606   449
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0     0   60  908   177  192  637   297   37  606   449
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0   60  908   177  192  637   297   37  606   449
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0   60  908   177  192  637   297   37  606   449
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 1.00 1.00  1.00 0.78 0.78  0.78 0.29 0.81  0.81 0.71 0.71  0.71
Lanes:      0.00 0.00  0.00 0.16 2.38  0.46 1.00 1.36  0.64 0.10 1.67  1.23
Final Sat.:    0    0     0  234 3534   689  559 2109   984  136 2232  1654
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.00  0.00 0.26 0.26  0.26 0.34 0.30  0.30 0.27 0.27  0.27
Crit Moves:                      ****       ****
Green/Cycle: 0.00 0.00  0.00 0.36 0.36  0.36 0.30 0.30  0.30 0.00 0.53  0.53
Volume/Cap: 0.00 0.00  0.00 0.71 0.71  0.71 1.14 1.01  1.01 xxxx 0.51  0.51
Delay/Veh:   0.0  0.0   0.0 23.4 23.4  23.4 139.9 57.4  57.4  0.0 12.3  12.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  0.0  0.0   0.0 23.4 23.4  23.4 139.9 57.4  57.4  0.0 12.3  12.3
DesignQueue:    0    0     0    2   26     5    6   20     9    2   12     9
*****************************************************************************
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365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #25 University Avenue / NB Shattuck Avenue

Cycle (sec):	75	Critical Vol./Cap. (X):	0.459
Loss Time (sec):	15 (Y+R = 4 sec)	Average Delay (sec/veh):	16.9
Optimal Cycle:	47	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	19	0	19	0	0	0	0	13	0	0	13	0
Lanes:	2 0 1! 0 1			0 0 0 0 0			0 0 2 0 0			0 0 2 0 0		
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	458	0	168	0	0	0	0	444	0	0	235	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	458	0	168	0	0	0	0	444	0	0	235	0
Added Vol:	53	0	18	0	0	0	0	181	0	0	13	0
Future:	220	0	20	0	0	0	0	0	0	0	80	0
Initial Fut:	731	0	206	0	0	0	0	625	0	0	328	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	731	0	206	0	0	0	0	625	0	0	328	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	731	0	206	0	0	0	0	625	0	0	328	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	731	0	206	0	0	0	0	625	0	0	328	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.81	1.00	0.84	1.00	1.00	1.00	1.00	0.86	1.00	1.00	0.86	1.00
Lanes:	2.71	0.00	1.29	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00
Final Sat.:	4180	0	2053	0	0	0	0	3249	0	0	3249	0
Capacity Analysis Module:												
Vol/Sat:	0.17	0.00	0.10	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.10	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.38	0.00	0.38	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.42	0.00
Volume/Cap:	0.46	0.00	0.26	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.24	0.00
Delay/Veh:	18.2	0.0	16.2	0.0	0.0	0.0	0.0	16.8	0.0	0.0	14.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	18.2	0.0	16.2	0.0	0.0	0.0	0.0	16.8	0.0	0.0	14.5	0.0
DesignQueue:	20	0	5	0	0	0	0	16	0	0	8	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #26 University Avenue / Oxford Street

Cycle (sec):	65	Critical Vol./Cap. (X):	0.901
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	39.5
Optimal Cycle:	131	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	5	18	18	5	18	18	18	18	18	18	18	18
Lanes:	1 0 1 1 0			1 0 1 1 0			1 1 0 0 1			0 0 1! 0 0		
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	147	487	4	41	1101	77	300	38	217	6	12	23
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	147	487	4	41	1101	77	300	38	217	6	12	23
Added Vol:	10	54	-2	-3	79	4	59	-6	147	0	-1	0
Future:	55	99	0	11	88	33	22	11	22	0	11	11
Initial Fut:	212	640	2	49	1268	114	381	43	386	6	22	34
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	212	640	2	49	1268	114	381	43	386	6	22	34
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	212	640	2	49	1268	114	381	43	386	6	22	34
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	212	640	2	49	1268	114	381	43	386	6	22	34
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.86	0.86	0.86	0.32	0.84	0.84	0.64	0.64	0.77	0.82	0.82	0.82
Lanes:	1.00	1.99	0.01	1.00	1.84	0.16	1.80	0.20	1.00	0.10	0.35	0.55
Final Sat.:	1625	3239	10	599	2945	265	2191	247	1454	150	552	853
Capacity Analysis Module:												
Vol/Sat:	0.13	0.20	0.20	0.08	0.43	0.43	0.17	0.17	0.27	0.04	0.04	0.04
Crit Moves:	****				****				****			
Green/Cycle:	0.41	0.41	0.41	0.41	0.41	0.41	0.30	0.30	0.30	0.30	0.30	0.30
Volume/Cap:	0.32	0.48	0.48	0.20	1.06	1.06	0.58	0.58	0.89	0.13	0.13	0.13
Delay/Veh:	14.4	15.5	15.5	14.3	60.3	60.3	22.6	22.6	43.9	17.2	17.2	17.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	14.4	15.5	15.5	14.3	60.3	60.3	22.6	22.6	43.9	17.2	17.2	17.2
DesignQueue:	5	14	0	1	30	3	10	1	10	0	1	1

```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #27 Univeristy Drive (East Gate)  / Gayley Road
********************************************************************************
Average Delay (sec/veh):      3.5          Worst Case Level Of Service:        D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    1  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:      69  476     0     0  543    75    53    0    73     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   69  476     0     0  543    75    53    0    73     0    0     0
Added Vol:    -13   35     0     0   64   -21    -2    0    -1     0    0     0
Future:        20   70     0     0  110    10    10    0    20     0    0     0
Initial Fut:   76  581     0     0  717    64    61    0    92     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    76  581     0     0  717    64    61    0    92     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    76  581     0     0  717    64    61    0    92     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  781 xxxx xxxxx  xxxx xxxx xxxxx  1482 xxxx   749  xxxx xxxx xxxxx
Potent Cap.:  845 xxxx xxxxx  xxxx xxxx xxxxx   139 xxxx   415  xxxx xxxx xxxxx
Move Cap.:    845 xxxx xxxxx  xxxx xxxx xxxxx   130 xxxx   415  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.7 xxxx xxxxx xxxxx xxxx xxxxx  55.3 xxxx  16.1 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     F    *     C     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx     0 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            31.7            xxxxxx
ApproachLOS:        *                *                D                *
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #28 Addison Street / Oxford Street
********************************************************************************
Average Delay (sec/veh):      1.3          Worst Case Level Of Service:        D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  2  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      54  647     0     0 1165    61     4    0    31     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   54  647     0     0 1165    61     4    0    31     0    0     0
Added Vol:     20   60     0     0  207    18     2    0     2     0    0     0
PasserByVol:   20  140     0     0   90    10     0    0    10     0    0     0
Initial Fut:   94  847     0     0 1462    89     6    0    43     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:   103  931     0     0 1607    98     7    0    47     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   103  931     0     0 1607    98     7    0    47     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1267 xxxx xxxxx  xxxx xxxx xxxxx  2097 xxxx   115  xxxx xxxx xxxxx
Potent Cap.:  411 xxxx xxxxx  xxxx xxxx xxxxx    34 xxxx   682  xxxx xxxx xxxxx
Move Cap.:    411 xxxx xxxxx  xxxx xxxx xxxxx    27 xxxx   682  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 16.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    C    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  174 xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 34.8 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    D     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            34.8            xxxxxx
ApproachLOS:        *                *                D                *
```

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-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #29 Center Street / SB Shattuck Avenue
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.447
Loss Time (sec):     12 (Y+R =  9 sec) Average Delay (sec/veh):      16.7
Optimal Cycle:       65              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0   20   20    20    0   22    22   33   33     0
Lanes:       0  0  0  0  0   0  1  1  1  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0     0   15  779    71    0   69    51   17  102     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0   15  779    71    0   69    51   17  102     0
Added Vol:     0    0     0    0   77     0    0    2     0    0    0     0
Future:        0    0     0    0  130    20    0   50    30   30   40     0
Initial Fut:   0    0     0   15  986    91    0  121    81   47  142     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0     0   15  986    91    0  121    81   47  142     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0   15  986    91    0  121    81   47  142     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0   15  986    91    0  121    81   47  142     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.80 0.80  0.80 1.00 0.85  0.85 0.80 0.80  1.00
Lanes:       0.00 0.00  0.00 0.04 2.71  0.25 0.00 0.60  0.40 0.25 0.75  0.00
Final Sat.:    0    0     0   63 4115   380    0  969   649  377 1138     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.24 0.24  0.24 0.00 0.12  0.12 0.12 0.12  0.00
Crit Moves:                       ****              ****
Green/Cycle: 0.00 0.00  0.00 0.31 0.31  0.31 0.00 0.34  0.34 0.51 0.51  0.00
Volume/Cap:  0.00 0.00  0.00 0.78 0.78  0.78 0.00 0.37  0.37 0.25 0.25  0.00
Delay/Veh:    0.0  0.0   0.0 18.7 18.7  18.7  0.0 18.2  18.2  3.6  3.6   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 18.7 18.7  18.7  0.0 18.2  18.2  3.6  3.6   0.0
DesignQueue:   0    0     0    0   26     2    0    3     2    1    3     0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #30 Center Street / NB Shattuck Avenue
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.394
Loss Time (sec):      8 (Y+R =  9 sec) Average Delay (sec/veh):       5.3
Optimal Cycle:       60              Level Of Service:                 A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   30   30    30    0    0     0   22   22     0    0   22    22
Lanes:       0  1  1  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     42  616    51    0    0     0   26   56     0    0   77    26
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  42  616    51    0    0     0   26   56     0    0   77    26
Added Vol:     0   87    -2    0    0     0    0    2     0    0    0     0
Future:       30  200    60    0    0     0   10   40     0    0   40    30
Initial Fut:  72  903   109    0    0     0   36   98     0    0  117    56
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   72  903   109    0    0     0   36   98     0    0  117    56
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  72  903   109    0    0     0   36   98     0    0  117    56
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   72  903   109    0    0     0   36   98     0    0  117    56
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.79 0.79  0.79 1.00 1.00  1.00 0.79 0.79  1.00 1.00 0.86  0.86
Lanes:       0.20 2.50  0.30 0.00 0.00  0.00 0.27 0.73  0.00 0.00 0.68  0.32
Final Sat.:   301 3773   455    0    0     0  405 1103     0    0 1106   529
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.24  0.24 0.00 0.00  0.00 0.09 0.09  0.00 0.00 0.11  0.11
Crit Moves:       ****                                               ****
Green/Cycle: 0.54 0.54  0.54 0.00 0.00  0.00 0.34 0.34  0.00 0.00 0.34  0.34
Volume/Cap:  0.44 0.44  0.44 0.00 0.00  0.00 0.26 0.26  0.00 0.00 0.31  0.31
Delay/Veh:    2.6  2.6   2.6  0.0  0.0   0.0 11.5 11.5   0.0  0.0 17.4  17.4
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   2.6  2.6   2.6  0.0  0.0   0.0 11.5 11.5   0.0  0.0 17.4  17.4
DesignQueue:   1   16     2    0    0     0    1    2     0    0    3     1
*******************************************************************************
```

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---------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
             Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
---------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #31 Center Street / Oxford Street
*********************************************************************************
Cycle (sec):          65                Critical Vol./Cap. (X):        0.674
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        13.3
Optimal Cycle:        46                Level Of Service:                  B
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    19   19    19   19   19    19   19   19    19   19   19    19
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      50  663    42   11 1145    39   26   10    43   19    6     8
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   50  663    42   11 1145    39   26   10    43   19    6     8
Added Vol:      0   77    -2   -5  214     0    4   -4     0    0    0     0
Future:        30   90    10    0   70    30   60    0    30    0    0     0
Initial Fut:   80  830    50    6 1429    69   90    6    73   19    6     8
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    80  830    50    6 1429    69   90    6    73   19    6     8
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   80  830    50    6 1429    69   90    6    73   19    6     8
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    80  830    50    6 1429    69   90    6    73   19    6     8
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.11 0.85  0.85 0.28 0.85  0.85 0.70 0.70  0.70 0.74 0.74  0.74
Lanes:       1.00 1.89  0.11 1.00 1.91  0.09 0.53 0.04  0.43 0.58 0.18  0.24
Final Sat.:   210 3037   183  525 3078   149  709   47   575  804  254   339
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.38 0.27  0.27 0.01 0.46  0.46 0.13 0.13  0.13 0.02 0.02  0.02
Crit Moves:                       ****             ****
Green/Cycle: 0.58 0.58  0.58 0.58 0.58  0.58 0.29 0.29  0.29 0.29 0.29  0.29
Volume/Cap:  0.65 0.47  0.47 0.02 0.79  0.79 0.43 0.43  0.43 0.08 0.08  0.08
Delay/Veh:   32.7  8.6   8.6  5.8 14.0  14.0 22.2 22.2  22.2 17.1 17.1  17.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  32.7  8.6   8.6  5.8 14.0  14.0 22.2 22.2  22.2 17.1 17.1  17.1
DesignQueue:    1   13     1    0   24     1    2    0     2    0    0     0
*********************************************************************************
```



```
---------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
             Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
---------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Future Volume Alternative)
*********************************************************************************
Intersection #32 Stadium Rim Road / Gayley Road
*********************************************************************************
Cycle (sec):         100                Critical Vol./Cap. (X):        1.192
Loss Time (sec):       0 (Y+R =  4 sec) Average Delay (sec/veh):        72.6
Optimal Cycle:         0                Level Of Service:                  F
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0  386    19  128  471     0   12    5    14   18    1   118
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  386    19  128  471     0   12    5    14   18    1   118
Added Vol:      0   17     2    1   62     0    0    0     0   23    0     5
Future:         0   66    11   22  110     0    0    0     0   11    0    22
Initial Fut:    0  469    32  151  643     0   12    5    14   52    1   145
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0  469    32  151  643     0   12    5    14   52    1   145
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0  469    32  151  643     0   12    5    14   52    1   145
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0  469    32  151  643     0   12    5    14   52    1   145
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.94  0.06 0.19 0.81  0.00 0.39 0.16  0.45 0.26 0.01  0.73
Final Sat.:     0  604    41  127  539     0  180   75   210  143    3   399
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.78  0.78 1.19 1.19  xxxx 0.07 0.07  0.07 0.36 0.36  0.36
Crit Moves:             ****      ****       ****                  ****
Delay/Veh:    0.0 24.7  24.7 120.3  120  0.0 10.6 10.6  10.6 12.7 12.7  12.7
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 24.7  24.7 120.3  120  0.0 10.6 10.6  10.6 12.7 12.7  12.7
LOS by Move:    *    C     C    F    F     *    B    B     B    B    B     B
ApproachDel:       24.7            120.3             10.6             12.7
Delay Adj:         1.00             1.00             1.00             1.00
ApprAdjDel:        24.7            120.3             10.6             12.7
LOS by Appr:          C                F                B                B
*********************************************************************************
```

```
--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #33 Allston Way / Oxford Street
********************************************************************************
Average Delay (sec/veh):      1.9          Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  1  0  0   0  1  0  1  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      17  798     0    59 1111    34    16    0    33     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   17  798     0    59 1111    34    16    0    33     0    0     0
Added Vol:      0   75     0     0  214     0     0    0     0     0    0     0
Future:        10  130     0    10   80    10     0    0    30     0    0     0
Initial Fut:   27 1003     0    69 1405    44    16    0    63     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:    29 1078     0    74 1511    47    17    0    68     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    29 1078     0    74 1511    47    17    0    68     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1050 xxxx xxxxx  1078 xxxx xxxxx  2042 xxxx    10  xxxx xxxx xxxxx
Potent Cap.:  503 xxxx xxxxx   654 xxxx xxxxx    37 xxxx   805  xxxx xxxx xxxxx
Move Cap.:    503 xxxx xxxxx   654 xxxx xxxxx    32 xxxx   805  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 12.6 xxxx xxxxx  11.2 xxxx xxxxx 204.1 xxxx   9.9 xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     F    *     A     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 12.6 xxxx xxxxx  11.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            49.2            xxxxxx
ApproachLOS:        *                *                E                *
```



```
--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #34 Kittridge Street / Oxford Street / Fulton Street
********************************************************************************
Average Delay (sec/veh): OVERFLOW          Worst Case Level Of Service:       F
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  1  0   0  1  0  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      13  801     0     0 1122    18     6    0    23     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   13  801     0     0 1122    18     6    0    23     0    0     0
Added Vol:      0   68    23    69  145     0     0   27     0     2    3     7
Future:         0  120     0     0   70    30    10    0    10     0    0     0
Initial Fut:   13  989    23    69 1337    48    16   27    33     2    3     7
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    13  989    23    69 1337    48    16   27    33     2    3     7
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    13  989    23    69 1337    48    16   27    33     2    3     7
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.5  6.5   6.9   7.5  6.5   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  513 xxxx xxxxx  1012 xxxx xxxxx  1521 2303     0  1257 2322   506
Potent Cap.:  701 xxxx xxxxx   693 xxxx xxxxx    55   26     0    86   25   517
Move Cap.:    701 xxxx xxxxx   693 xxxx xxxxx    44   23     0     0   22   517
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 10.2 xxxx xxxxx  10.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   49 xxxxx  xxxx    0 xxxxx
Shrd StpDel: 10.2 xxxx xxxxx  10.8 xxxx xxxxx xxxxx  466 xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    F     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           466.0            xxxxxx
ApproachLOS:        *                *                F                F
```

```
----------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
----------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
**********************************************************************************
Intersection #35 Stadium Rim Road / Centennial Drive
**********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.339
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):        9.5
Optimal Cycle:        0              Level Of Service:                 A
**********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  0  0  0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    70   160    94    22     0     0     0     0   114     0    71
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    0    70   160    94    22     0     0     0     0   114     0    71
Added Vol:      0     0     0     3     0     0     0     0     0     0     0    28
Future:         0    22    22    22    11     0     0     0     0    22     0    11
Initial Fut:    0    92   182   119    33     0     0     0     0   136     0   110
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:     0    92   182   119    33     0     0     0     0   136     0   110
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    0    92   182   119    33     0     0     0     0   136     0   110
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Final Vol.:     0    92   182   119    33     0     0     0     0   136     0   110
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.00  0.34  0.66  0.78  0.22  0.00  0.00  0.00  0.00  0.55  0.00  0.45
Final Sat.:     0   271   537   545   151     0     0     0     0   405     0   328
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx  0.34  0.34  0.22  0.22  xxxx  xxxx  xxxx  xxxx  0.34  xxxx  0.34
Crit Moves:        ****              ****                                      ****
Delay/Veh:    0.0   9.3   9.3   9.2   9.2   0.0   0.0   0.0   0.0   9.8   0.0   9.8
Delay Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:   0.0   9.3   9.3   9.2   9.2   0.0   0.0   0.0   0.0   9.8   0.0   9.8
LOS by Move:    *     A     A     A     A     *     *     *     *     A     *     A
ApproachDel:        9.3               9.2              xxxxxx             9.8
Delay Adj:         1.00              1.00               xxxxx            1.00
ApprAdjDel:         9.3               9.2              xxxxxx             9.8
LOS by Appr:         A                 A                  *                A
**********************************************************************************
```



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----------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
----------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
**********************************************************************************
Intersection #36 Bancroft Way / Shattuck Avenue
**********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.614
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       10.6
Optimal Cycle:       42              Level Of Service:                 B
**********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18    18     0     0    18    18     0     0     0    16    16    16
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      29   912     0     0   788    12     1     0    62   116    51    71
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   29   912     0     0   788    12     1     0    62   116    51    71
Added Vol:      0   103     0     0    80     0     0     0     0    12     0     9
Future:        11   308     0     0   209    11     0     0     0    33    11    11
Initial Fut:   40  1323     0     0  1077    23     1     0    62   161    62    91
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:    40  1323     0     0  1077    23     1     0    62   161    62    91
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   40  1323     0     0  1077    23     1     0    62   161    62    91
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Final Vol.:    40  1323     0     0  1077    23     1     0    62   161    62    91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  0.23  0.86  1.00  1.00  0.85  0.85  0.78  1.00  0.78  0.65  0.82  0.82
Lanes:       1.00  2.00  0.00  0.00  1.96  0.04  0.02  0.00  0.98  1.00  0.41  0.59
Final Sat.:   445  3249     0     0  3172    68    23     0  1453  1228   631   927
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09  0.41  0.00  0.00  0.34  0.34  0.04  0.00  0.04  0.13  0.10  0.10
Crit Moves:        ****                                            ****
Green/Cycle: 0.63  0.63  0.00  0.00  0.63  0.63  0.25  0.00  0.25  0.25  0.25  0.25
Volume/Cap:  0.14  0.65  0.00  0.00  0.54  0.54  0.17  0.00  0.17  0.53  0.40  0.40
Delay/Veh:    5.9   9.1   0.0   0.0   7.7   7.7  20.3   0.0  20.3  27.8  23.6  23.6
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:   5.9   9.1   0.0   0.0   7.7   7.7  20.3   0.0  20.3  27.8  23.6  23.6
DesignQueue:    1    19     0     0    16     0     0     0     2     4     2     3
**********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #37 Bancroft Way / Fulton Street

Cycle (sec): 65 Critical Vol./Cap. (X): 0.420
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 9.7
Optimal Cycle: 49 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Ignore		
Min. Green:	17	17	0	0	17	17	0	0	0	24	24	24
Lanes:	0 1	1 0	0	0 0	2 1	0	0 0	0 0	0	0 1	1 0	1

Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM

Base Vol:	13	146	0	0	1071	79	0	0	0	84	173	650
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	13	146	0	0	1071	79	0	0	0	84	173	650
Added Vol:	13	0	0	0	127	20	0	0	0	2	23	91
Future:	10	10	0	0	60	10	0	0	0	10	20	110
Initial Fut:	36	156	0	0	1258	109	0	0	0	96	216	851
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	36	156	0	0	1258	109	0	0	0	96	216	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	36	156	0	0	1258	109	0	0	0	96	216	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Final Vol.:	36	156	0	0	1258	109	0	0	0	96	216	0

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.71	0.71	1.00	1.00	0.90	0.90	1.00	1.00	1.00	0.81	0.81	1.00
Lanes:	0.37	1.63	0.00	0.00	2.76	0.24	0.00	0.00	0.00	0.62	1.38	1.00
Final Sat.:	506	2194	0	0	4716	409	0	0	0	944	2124	1900

Capacity Analysis Module:

Vol/Sat:	0.07	0.07	0.00	0.00	0.27	0.27	0.00	0.00	0.00	0.10	0.10	0.00
Crit Moves:					****						****	
Green/Cycle:	0.51	0.51	0.00	0.00	0.51	0.51	0.00	0.00	0.00	0.37	0.37	0.00
Volume/Cap:	0.14	0.14	0.00	0.00	0.53	0.53	0.00	0.00	0.00	0.28	0.28	0.00
Delay/Veh:	6.6	6.6	0.0	0.0	8.9	8.9	0.0	0.0	0.0	15.0	15.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.6	6.6	0.0	0.0	8.9	8.9	0.0	0.0	0.0	15.0	15.0	0.0
DesignQueue:	1	3	0	0	24	2	0	0	0	2	5	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #38 Bancroft Way / Ellsworth Street

Average Delay (sec/veh): 6.4 Worst Case Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	1 1	0 0	0	0 0	0 0	1	0 0	0 0	0	0 0	1 1	0

Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM

Base Vol:	241	60	0	0	0	11	0	0	0	0	674	39
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	241	60	0	0	0	11	0	0	0	0	674	39
Added Vol:	96	0	0	0	0	0	0	0	0	0	128	0
Future:	10	0	0	0	0	0	0	0	0	0	130	0
Initial Fut:	347	60	0	0	0	11	0	0	0	0	932	39
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	347	60	0	0	0	11	0	0	0	0	932	39
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	347	60	0	0	0	11	0	0	0	0	932	39

Critical Gap Module:

Critical Gp:	7.1	6.5	xxxxx	xxxxx	xxxx	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx

Capacity Module:

Cnflict Vol:	466	971	xxxxx	xxxx	xxxx	486	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	510	255	xxxxx	xxxx	xxxx	586	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	501	255	xxxxx	xxxx	xxxx	586	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx

Level Of Service Module:

Stopped Del:	16.0	xxxx	xxxxx	xxxxx	xxxx	11.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	C	*	*	*	*	B	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	401	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	25.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	D	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		21.6			11.3			xxxxxx			xxxxxx	
ApproachLOS:		C			B			*			*	

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #39 Bancroft Way / Dana Street

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 0 0 0			0 0 0 0 0			0 0 0 0 0			0 1 2 0 0		
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	0	0	0	0	0	0	0	0	0	145	721	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	0	0	0	145	721	0
Added Vol:	0	0	0	0	0	0	0	0	0	4	128	0
Future:	0	0	0	0	0	0	0	0	0	50	130	0
Initial Fut:	0	0	0	0	0	0	0	0	0	199	979	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	0	0	0	0	0	199	979	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	0	0	0	0	0	0	0	0	0	199	979	0
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0	xxxx	xxxxx
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0	xxxx	xxxxx
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	A	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	*			*			*			*		

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #40 Bancroft Way / Telegraph Avenue

Cycle (sec): 65 Critical Vol./Cap. (X): 0.327
Loss Time (sec): 8 (Y+R = 23 sec) Average Delay (sec/veh): 21.6
Optimal Cycle: 46 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	15	0	0	0	0	0	0	0	0	0	23	0
Lanes:	2 0 0 0 0			0 0 0 0 0			0 0 0 0 0			0 0 3 0 0		
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	427	0	0	0	0	0	0	0	0	0	460	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	427	0	0	0	0	0	0	0	0	0	460	0
Added Vol:	24	0	0	0	0	0	0	0	0	0	143	0
Future:	100	0	0	0	0	0	0	0	0	0	70	0
Initial Fut:	551	0	0	0	0	0	0	0	0	0	673	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	551	0	0	0	0	0	0	0	0	0	673	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	551	0	0	0	0	0	0	0	0	0	673	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	551	0	0	0	0	0	0	0	0	0	673	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00
Final Sat.:	3502	0	0	0	0	0	0	0	0	0	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00
Crit Moves:	****										****	
Green/Cycle:	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00
Volume/Cap:	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00
Delay/Veh:	28.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2	0.0
DesignQueue:	16	0	0	0	0	0	0	0	0	0	16	0

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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #41 Bancroft Way / Bowditch Street
********************************************************************************
Cycle (sec):        100             Critical Vol./Cap. (X):        0.596
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):      14.1
Optimal Cycle:        0             Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     191    0    0     0    0    0     0    0    0    99  494    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  191    0    0     0    0    0     0    0    0    99  494    0
Added Vol:      0    0    0     0    0    0     0    0    0     3  143    0
Future:        10    0    0     0    0    0     0    0    0    20   60    0
Initial Fut:  201    0    0     0    0    0     0    0    0   122  697    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   201    0    0     0    0    0     0    0    0   122  697    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  201    0    0     0    0    0     0    0    0   122  697    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   201    0    0     0    0    0     0    0    0   122  697    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.00  0.30 1.70 0.00
Final Sat.:   625    0    0     0    0    0     0    0    0   205 1189    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.32 xxxx xxxx  xxxx xxxx xxxx  xxxx xxxx xxxx  0.60 0.59 xxxx
Crit Moves:  ****                                            ****
Delay/Veh:   11.1  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0  15.2 14.7  0.0
Delay Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  11.1  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0  15.2 14.7  0.0
LOS by Move:   B    *    *     *    *    *     *    *    *     C    B    *
ApproachDel:      11.1            xxxxxx           xxxxxx           14.8
Delay Adj:        1.00             xxxxx            xxxxx           1.00
ApprAdjDel:       11.1            xxxxxx           xxxxxx           14.8
LOS by Appr:        B                *                *               B
********************************************************************************
```



```
--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #42 Bancroft Way / College Avenue
********************************************************************************
Cycle (sec):        100             Critical Vol./Cap. (X):        0.747
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):      16.9
Optimal Cycle:        0             Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     343    0    0     0    0    0     0    0    0    34  203    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  343    0    0     0    0    0     0    0    0    34  203    0
Added Vol:    157    0    0     0    0    0     0    0    0     0  132    0
Future:        11    0    0     0    0    0     0    0    0    22   66    0
Initial Fut:  511    0    0     0    0    0     0    0    0    56  401    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   511    0    0     0    0    0     0    0    0    56  401    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  511    0    0     0    0    0     0    0    0    56  401    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   511    0    0     0    0    0     0    0    0    56  401    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.00  0.25 1.75 0.00
Final Sat.:   685    0    0     0    0    0     0    0    0   144 1043    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.75 xxxx xxxx  xxxx xxxx xxxx  xxxx xxxx xxxx  0.39 0.38 xxxx
Crit Moves:  ****                                            ****
Delay/Veh:   21.3  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0  12.2 12.0  0.0
Delay Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  21.3  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0  12.2 12.0  0.0
LOS by Move:   C    *    *     *    *    *     *    *    *     B    B    *
ApproachDel:      21.3            xxxxxx           xxxxxx           12.1
Delay Adj:        1.00             xxxxx            xxxxx           1.00
ApprAdjDel:       21.3            xxxxxx           xxxxxx           12.1
LOS by Appr:        C                *                *               B
********************************************************************************
```

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-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
*******************************************************************************
Intersection #43 Bancroft Way / Piedmont Avenue
*******************************************************************************
Cycle (sec):       100              Critical Vol./Cap. (X):        1.175
Loss Time (sec):     0 (Y+R =  4 sec) Average Delay (sec/veh):      74.4
Optimal Cycle:       0              Level Of Service:                  F
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     131  553    0    0  344  123    0    0    0    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  131  553    0    0  344  123    0    0    0    0    0    0
Added Vol:    104   56    0    0   44   28    0    0    0    0    0    0
Future:        11   66    0    0   44   66    0    0    0    0    0    0
Initial Fut:  246  675    0    0  432  217    0    0    0    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   246  675    0    0  432  217    0    0    0    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  246  675    0    0  432  217    0    0    0    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   246  675    0    0  432  217    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.27 0.73 0.00 0.00 0.67 0.33 0.00 0.00 0.00 0.00 0.00 0.00
Final Sat.:   209  574    0    0  534  268    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     1.18 1.18 xxxx xxxx 0.81 0.81 xxxx xxxx xxxx xxxx xxxx xxxx
Crit Moves:       ****                ****
Delay/Veh:  110.2  110  0.0  0.0 23.6 23.6  0.0  0.0  0.0  0.0  0.0  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 110.2  110  0.0  0.0 23.6 23.6  0.0  0.0  0.0  0.0  0.0  0.0
LOS by Move:    F    F    *    *    C    C    *    *    *    *    *    *
ApproachDel:      110.2             23.6           xxxxxx           xxxxxx
Delay Adj:         1.00             1.00            xxxxx            xxxxx
ApprAdjDel:       110.2             23.6           xxxxxx           xxxxxx
LOS by Appr:        F                C                *                *
*******************************************************************************
```



```
-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #44 Durant Avenue / Shattuck Avenue
*******************************************************************************
Cycle (sec):        65              Critical Vol./Cap. (X):        0.744
Loss Time (sec):    12 (Y+R =  5 sec) Average Delay (sec/veh):      13.9
Optimal Cycle:      58              Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    19   19   19    5   19   19   17   17   17    0    0    0
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      55  943  136   67  886    8    9   70   35    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   55  943  136   67  886    8    9   70   35    0    0    0
Added Vol:      0  103  102   66   25    0    0    0    0    0    0    0
Future:        10   90   70   40  180   10  200   40    0    0    0    0
Initial Fut:   65 1136  308  173 1091   18  209  110   35    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    65 1136  308  173 1091   18  209  110   35    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   65 1136  308  173 1091   18  209  110   35    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    65 1136  308  173 1091   18  209  110   35    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  1.00 0.95 0.95 1.00 0.95 0.95 0.95 0.95 0.95 1.00 1.00 1.00
Lanes:       1.00 1.57 0.43 1.00 1.97 0.03 1.00 0.76 0.24 0.00 0.00 0.00
Final Sat.:  1900 2840  770 1900 3551   59 1805 1369  436    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.40 0.40 0.09 0.31 0.31 0.12 0.08 0.08 0.00 0.00 0.00
Crit Moves:       ****      ****                ****
Green/Cycle: 0.45 0.45 0.45 0.10 0.55 0.55 0.26 0.28 0.28 0.00 0.00 0.00
Volume/Cap:  0.08 0.89 0.89 0.89 0.55 0.55 0.44 0.29 0.29 0.00 0.00 0.00
Delay/Veh:    4.8 14.9 14.9 66.9  2.7  2.7 21.8 18.9 18.9  0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:   4.8 14.9 14.9 66.9  2.7  2.7 21.8 18.9 18.9  0.0  0.0  0.0
DesignQueue:    1   25    7    6   19    0    6    3    1    0    0    0
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #45 Durant Avenue / Fulton Street
********************************************************************************
Cycle (sec):         65                Critical Vol./Cap. (X):        0.458
Loss Time (sec):      8 (Y+R =  3 sec) Average Delay (sec/veh):        10.9
Optimal Cycle:       51                Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0   21   21     0   22   22    22    0    0     0
Lanes:       0  0  0  0  0   1  1  1  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0     0  459  656     0  123  262    27    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0  459  656     0  123  262    27    0    0     0
Added Vol:     0    0     0   96   34     0   13  156     0    0    0     0
Future:        0    0     0   30   40     0   20   90    30    0    0     0
Initial Fut:   0    0     0  585  730     0  156  508    57    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0     0  585  730     0  156  508    57    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0  585  730     0  156  508    57    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0  585  730     0  156  508    57    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.95 0.95  1.00 0.99 0.94  0.94 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 1.33 1.67  0.00 1.00 1.80  0.20 0.00 0.00  0.00
Final Sat.:    0    0     0 2409 3006     0 1872 3197   359    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.24 0.24  0.00 0.08 0.16  0.16 0.00 0.00  0.00
Crit Moves:                       ****             ****
Green/Cycle: 0.00 0.00  0.00 0.53 0.53  0.00 0.35 0.35  0.35 0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.00 0.46 0.46  0.00 0.24 0.46  0.46 0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0  7.3  7.3   0.0 16.0 17.7  17.7  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  7.3  7.3   0.0 16.0 17.7  17.7  0.0  0.0   0.0
DesignQueue:   0    0     0   11   13     0    4   12     1    0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #46 Durant Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):         65                Critical Vol./Cap. (X):        0.370
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        12.0
Optimal Cycle:       43                Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   18    18    0    0     0   17   17     0    0    0     0
Lanes:       0  0  1  1  0   0  0  0  0  0   0  1  2  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  362    86    0    0     0   73  387     0    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  362    86    0    0     0   73  387     0    0    0     0
Added Vol:     0    7    23    0    0     0   17  138     0    0    0     0
Future:        0  110    40    0    0     0    0  130     0    0    0     0
Initial Fut:   0  479   149    0    0     0   90  655     0    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  479   149    0    0     0   90  655     0    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  479   149    0    0     0   90  655     0    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  479   149    0    0     0   90  655     0    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.92  0.92 1.00 1.00  1.00 0.91 0.91  1.00 1.00 1.00  1.00
Lanes:       0.00 1.53  0.47 0.00 0.00  0.00 0.36 2.64  0.00 0.00 0.00  0.00
Final Sat.:    0 2654   826    0    0     0  627 4560     0    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.18 0.00 0.00  0.00 0.14 0.14  0.00 0.00 0.00  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.00 0.49  0.49 0.00 0.00  0.00 0.39 0.39  0.00 0.00 0.00  0.00
Volume/Cap:  0.00 0.37  0.37 0.00 0.00  0.00 0.37 0.37  0.00 0.00 0.00  0.00
Delay/Veh:    0.0  8.8   8.8  0.0  0.0   0.0 14.7 14.7   0.0  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  8.8   8.8  0.0  0.0   0.0 14.7 14.7   0.0  0.0  0.0   0.0
DesignQueue:   0    9     3    0    0     0    2   15     0    0    0     0
********************************************************************************
```

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #47 Durant Avenue / College Avenue
********************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        0.430
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):      13.4
Optimal Cycle:        42              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0   18    18    0    0     0   16   16    16    0    0     0
Lanes:       0  0  0  1  0   0  1  0  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  213    66   13   23     0   64  228    87    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  213    66   13   23     0   64  228    87    0    0     0
Added Vol:     0   29     3    0    0     0  128   34     2    0    0     0
Future:        0   11    99    0   22     0   22   99    44    0    0     0
Initial Fut:   0  253   168   13   45     0  214  361   133    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  253   168   13   45     0  214  361   133    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  253   168   13   45     0  214  361   133    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  253   168   13   45     0  214  361   133    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.95  0.95 0.92 0.92  1.00 0.96 0.91  0.91 1.00 1.00  1.00
Lanes:       0.00 0.60  0.40 0.22 0.78  0.00 1.00 1.46  0.54 0.00 0.00  0.00
Final Sat.:    0 1080   717  391 1352     0 1824 2533   933    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.23 0.03 0.03  0.00 0.12 0.14  0.14 0.00 0.00  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.00 0.55  0.55 0.55 0.55  0.00 0.33 0.33  0.33 0.00 0.00  0.00
Volume/Cap:  0.00 0.43  0.43 0.06 0.06  0.00 0.35 0.43  0.43 0.00 0.00  0.00
Delay/Veh:    0.0  7.4   7.4  7.1  7.1   0.0 17.4 17.4  17.4  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  7.4   7.4  7.1  7.1   0.0 17.4 17.4  17.4  0.0  0.0   0.0
DesignQueue:   0    4     3    0    1     0    5    9     3    0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #48 Durant Avenue / Piedmont Avenue
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap. (X):        1.064
Loss Time (sec):       0 (Y+R =  4 sec) Average Delay (sec/veh):      45.5
Optimal Cycle:         0              Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1  0  0   0  0  1  0  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  489     0    0  345     0  158    0    86    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  489     0    0  345     0  158    0    86    0    0     0
Added Vol:     0  132     0    0   44     0   28    0     9    0    0     0
Future:        0   50     0    0   40     0   30    0    60    0    0     0
Initial Fut:   0  671     0    0  429     0  216    0   155    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  671     0    0  429     0  216    0   155    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  671     0    0  429     0  216    0   155    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  671     0    0  429     0  216    0   155    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 1.00  0.00 0.00 1.00  0.00 1.00 0.00  1.00 0.00 0.00  0.00
Final Sat.:    0  630     0    0  597     0  471    0   557    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 1.06  xxxx xxxx 0.72  xxxx 0.46 xxxx  0.28 xxxx xxxx  xxxx
Crit Moves:       ****             ****        ****
Delay/Veh:    0.0 77.4   0.0  0.0 22.5   0.0 16.3  0.0  11.4  0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 77.4   0.0  0.0 22.5   0.0 16.3  0.0  11.4  0.0  0.0   0.0
LOS by Move:   *    F     *    *    C     *    C    *     B    *    *     *
ApproachDel:      77.4             22.5             14.3            xxxxxx
Delay Adj:        1.00             1.00             1.00             xxxxx
ApprAdjDel:       77.4             22.5             14.3            xxxxxx
LOS by Appr:        F                C                B                *
********************************************************************************
```

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------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #49 Channing Way / Shattuck Avenue
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.648
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        7.1
Optimal Cycle:       46              Level Of Service:                  A
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16    16   16    16    22   22    22    22   22    22
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      42 1070    96    19  868    19    12   59    42    62   28    39
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   42 1070    96    19  868    19    12   59    42    62   28    39
Added Vol:      0  203    44     0   25     0     0    0     0     3    0     3
Future:        20  130    20    40   90    70    30   40    20    30   10    10
Initial Fut:   62 1403   160    59  983    89    42   99    62    95   38    52
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    62 1403   160    59  983    89    42   99    62    95   38    52
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   62 1403   160    59  983    89    42   99    62    95   38    52
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    62 1403   160    59  983    89    42   99    62    95   38    52
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.26 0.94  0.94  0.12 0.94  0.94  0.88 0.88  0.88  0.76 0.76  0.76
Lanes:       1.00 1.80  0.20  1.00 1.83  0.17  0.21 0.49  0.30  0.51 0.21  0.28
Final Sat.:   502 3192   364   232 3271   296   345  812   509   741  296   405
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.44  0.44  0.25 0.30  0.30  0.12 0.12  0.12  0.13 0.13  0.13
Crit Moves:       ****                                               ****
Green/Cycle: 0.54 0.54  0.54  0.54 0.54  0.54  0.34 0.34  0.34  0.34 0.34  0.34
Volume/Cap:  0.23 0.82  0.82  0.47 0.56  0.56  0.36 0.36  0.36  0.38 0.38  0.38
Delay/Veh:    3.7  6.7   6.7  14.4  3.4   3.4  18.0 18.0  18.0  18.5 18.5  18.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   3.7  6.7   6.7  14.4  3.4   3.4  18.0 18.0  18.0  18.5 18.5  18.5
DesignQueue:    1   26     3     1   18     2     1    2     2     2    1     1
******************************************************************************
```



```
------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
******************************************************************************
Intersection #50 Channing Way / Fulton Street
******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.604
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       14.7
Optimal Cycle:        0              Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  0  0  0   0  1  0  1  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0    86  543    51     0  132    20     7   72     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    86  543    51     0  132    20     7   72     0
Added Vol:      0    0     0    32    2     0     0   44     0     0    6     0
Future:         0    0     0     0   30     0     0   90     0    10   40     0
Initial Fut:    0    0     0   118  575    51     0  266    20    17  118     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   118  575    51     0  266    20    17  118     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0   118  575    51     0  266    20    17  118     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    0     0   118  575    51     0  266    20    17  118     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 0.00  0.00  0.32 1.54  0.14  0.00 0.93  0.07  0.13 0.87  0.00
Final Sat.:     0    0     0   195  975    88     0  579    44    73  509     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx  0.60 0.59  0.58  xxxx 0.46  0.46  0.23 0.23  xxxx
Crit Moves:                   ****                  ****        ****
Delay/Veh:    0.0  0.0   0.0  16.7 15.9  15.3   0.0 13.1  13.1  10.6 10.6   0.0
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  16.7 15.9  15.3   0.0 13.1  13.1  10.6 10.6   0.0
LOS by Move:    *    *     *     C    C     C     *    B     B     B    B     *
ApproachDel:    xxxxxx            16.0             13.1             10.6
Delay Adj:       xxxxx            1.00             1.00             1.00
ApprAdjDel:     xxxxxx            16.0             13.1             10.6
LOS by Appr:       *                C                B                B
******************************************************************************
```

```
--------------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #51 Channing Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.491
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       11.9
Optimal Cycle:       43              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    0    0     0   17   17     0    0   17    17
Lanes:        0  1  0  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00-9:00 AM (WB thru adjusted due
Base Vol:      56  423    79    0    0     0   16  179     0    0   98     9
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   56  423    79    0    0     0   16  179     0    0   98     9
Added Vol:      0   30    68    0    0     0    0   76     0    0    6     0
Future:        10   40    30    0    0     0   60   30     0    0   30    50
Initial Fut:   66  493   177    0    0     0   76  285     0    0  134    59
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    66  493   177    0    0     0   76  285     0    0  134    59
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   66  493   177    0    0     0   76  285     0    0  134    59
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    66  493   177    0    0     0   76  285     0    0  134    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.88 0.88  0.88 1.00 1.00  1.00 0.90 0.90  1.00 1.00 0.96  0.96
Lanes:       0.18 1.34  0.48 0.00 0.00  0.00 0.21 0.79  0.00 0.00 0.69  0.31
Final Sat.:   301 2247   807    0    0     0  360 1349     0    0 1265   557
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.22  0.22 0.00 0.00  0.00 0.21 0.21  0.00 0.00 0.11  0.11
Crit Moves:       ****                             ****
Green/Cycle: 0.45 0.45  0.45 0.00 0.00  0.00 0.43 0.43  0.00 0.00 0.43  0.43
Volume/Cap:  0.49 0.49  0.49 0.00 0.00  0.00 0.49 0.49  0.00 0.00 0.25  0.25
Delay/Veh:   11.0 11.0  11.0  0.0  0.0   0.0 13.9 13.9   0.0  0.0 12.0  12.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  11.0 11.0  11.0  0.0  0.0   0.0 13.9 13.9   0.0  0.0 12.0  12.0
DesignQueue:    1   10     4    0    0     0    2    6     0    0    3     1
********************************************************************************
```



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--------------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #52 Channing Way / College Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.597
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       21.7
Optimal Cycle:       43              Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18   18   18    18    0    0     0   17   17    17
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM (WB thru, NB righ
Base Vol:      26  256    22    6   92     2   21   76    31   88  150    43
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   26  256    22    6   92     2   21   76    31   88  150    43
Added Vol:     25   32    -4    0    2     0    0    9     2    0   77     0
Future:        20   50    20    0   60    10   10   40    30   70   40    30
Initial Fut:   71  338    38    6  154    12   31  125    63  158  267    73
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    71  338    38    6  154    12   31  125    63  158  267    73
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   71  338    38    6  154    12   31  125    63  158  267    73
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    71  338    38    6  154    12   31  125    63  158  267    73
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.92 0.92  0.92 0.99 0.99  0.99 0.96 0.96  0.96 0.98 0.98  0.98
Lanes:       0.16 0.76  0.08 0.03 0.90  0.07 0.14 0.57  0.29 0.32 0.53  0.15
Final Sat.:   278 1321   149   66 1686   131  258 1042   525  591  998   273
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.26 0.26  0.26 0.09 0.09  0.09 0.12 0.12  0.12 0.27 0.27  0.27
Crit Moves:       ****                                              ****
Green/Cycle: 0.58 0.58  0.58 0.58 0.58  0.58 0.30 0.30  0.30 0.30 0.30  0.30
Volume/Cap:  0.44 0.44  0.44 0.16 0.16  0.16 0.40 0.40  0.40 0.90 0.90  0.90
Delay/Veh:    6.2  6.2   6.2  4.2  4.2   4.2 20.5 20.5  20.5 42.2 42.2  42.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   6.2  6.2   6.2  4.2  4.2   4.2 20.5 20.5  20.5 42.2 42.2  42.2
DesignQueue:    1    5     1    0    2     0    1    3     2    4    7     2
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #53 Haste Street / Shattuck Avenue

Cycle (sec): 65 Critical Vol./Cap. (X): 0.704
Loss Time (sec): 8 (Y+R = 6 sec) Average Delay (sec/veh): 42.4
Optimal Cycle: 47 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	21	21	0	0	21	21	0	0	0	18	18	18
Lanes:	1 0 2 0 0			0 0 1 1 0			0 0 0 0 0			0 1 0 1 0		
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	66	1117	0	0	903	46	0	0	0	185	276	75
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	66	1117	0	0	903	46	0	0	0	185	276	75
Added Vol:	0	246	0	0	23	5	0	0	0	4	8	0
Future:	10	130	0	0	110	20	0	0	0	30	110	20
Initial Fut:	76	1493	0	0	1036	71	0	0	0	219	394	95
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	76	1493	0	0	1036	71	0	0	0	219	394	95
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	76	1493	0	0	1036	71	0	0	0	219	394	95
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	76	1493	0	0	1036	71	0	0	0	219	394	95
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.17	0.95	1.00	1.00	0.94	0.94	1.00	1.00	1.00	0.91	0.91	0.91
Lanes:	1.00	2.00	0.00	0.00	1.87	0.13	0.00	0.00	0.00	0.62	1.11	0.27
Final Sat.:	315	3610	0	0	3345	229	0	0	0	1072	1929	465
Capacity Analysis Module:												
Vol/Sat:	0.24	0.41	0.00	0.00	0.31	0.31	0.00	0.00	0.00	0.20	0.20	0.20
Crit Moves:		****									****	
Green/Cycle:	0.37	0.37	0.00	0.00	0.37	0.37	0.00	0.00	0.00	0.51	0.51	0.51
Volume/Cap:	0.65	1.12	0.00	0.00	0.84	0.84	0.00	0.00	0.00	0.40	0.40	0.40
Delay/Veh:	35.2	76.1	0.0	0.0	17.8	17.8	0.0	0.0	0.0	10.6	10.6	10.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.2	76.1	0.0	0.0	17.8	17.8	0.0	0.0	0.0	10.6	10.6	10.6
DesignQueue:	2	38	0	0	26	2	0	0	0	4	7	2

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #54 Haste Street / Fulton Street

Cycle (sec): 80 Critical Vol./Cap. (X): 0.379
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 15.2
Optimal Cycle: 53 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	25	25	0	0	0	20	20	0
Lanes:	0 0 0 0 0			0 0 1 1 0			0 0 0 0 0			0 1 1 0 0		
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	0	0	0	0	433	145	0	0	0	23	380	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	433	145	0	0	0	23	380	0
Added Vol:	0	0	0	0	1	1	0	0	0	0	12	0
Future:	0	0	0	0	50	20	0	0	0	0	140	0
Initial Fut:	0	0	0	0	484	166	0	0	0	23	532	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	484	166	0	0	0	23	532	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	484	166	0	0	0	23	532	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	484	166	0	0	0	23	532	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	0.00	0.00	1.49	0.51	0.00	0.00	0.00	0.08	1.92	0.00
Final Sat.:	0	0	0	0	2586	887	0	0	0	150	3460	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.19	0.19	0.00	0.00	0.00	0.15	0.15	0.00
Crit Moves:					****						****	
Green/Cycle:	0.00	0.00	0.00	0.00	0.49	0.49	0.00	0.00	0.00	0.41	0.41	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00	0.38	0.38	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	13.2	13.2	0.0	0.0	0.0	17.4	17.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	13.2	13.2	0.0	0.0	0.0	17.4	17.4	0.0
DesignQueue:	0	0	0	0	11	4	0	0	0	1	15	0

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Cum+UC Proj+25 Inc AM      Fri May 7, 2004 14:48:18              Page 62-1
------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #55 Haste Street / Telegraph Avenue
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.447
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       16.9
Optimal Cycle:       40              Level Of Service:                 B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   16   16     0    0    0     0    0    0     0    0   16    16
Lanes:       0  1  1  0  0   0  0  0  0  0   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     216  520     0    0    0     0    0    0     0    0  334    34
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  216  520     0    0    0     0    0    0     0    0  334    34
Added Vol:      0   98     0    0    0     0    0    0     0    0   12     0
Future:        20   50     0    0    0     0    0    0     0    0   90    30
Initial Fut:  236  668     0    0    0     0    0    0     0    0  436    64
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   236  668     0    0    0     0    0    0     0    0  436    64
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  236  668     0    0    0     0    0    0     0    0  436    64
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   236  668     0    0    0     0    0    0     0    0  436    64
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.95  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.93  0.93
Lanes:       0.52 1.48  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 1.74  0.26
Final Sat.:   942 2668     0    0    0     0    0    0     0    0 3088   453
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.25 0.25  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.14  0.14
Crit Moves:       ****                                             ****
Green/Cycle: 0.34 0.34  0.34 0.00 0.00  0.00 0.00 0.00  0.00 0.53 0.53  0.53
Volume/Cap:  0.73 0.73  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.26  0.26
Delay/Veh:   21.6 21.6   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  8.6   8.6
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  21.6 21.6   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  8.6   8.6
DesignQueue:    6   17     0    0    0     0    0    0     0    0    8     1
******************************************************************************
```

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```
Cum+UC Proj+25 Inc AM      Fri May 7, 2004 14:48:18              Page 63-1
------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #56 Haste Street / College Avenue
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.600
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       11.1
Optimal Cycle:       40              Level Of Service:                 B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   16   16     0    0   16    16    0    0     0   16   16    16
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     167  267     0    0  115    69    0    0     0   48  223    21
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  167  267     0    0  115    69    0    0     0   48  223    21
Added Vol:     19   53     0    0    4     0    0    0     0    0   12     0
Future:        30   40     0    0   90    60    0    0     0   30   30    40
Initial Fut:  216  360     0    0  209   129    0    0     0   78  265    61
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   216  360     0    0  209   129    0    0     0   78  265    61
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  216  360     0    0  209   129    0    0     0   78  265    61
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   216  360     0    0  209   129    0    0     0   78  265    61
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.74 0.74  1.00 1.00 0.95  0.95 1.00 1.00  1.00 0.91 0.91  0.91
Lanes:       0.37 0.63  0.00 0.00 0.62  0.38 0.00 0.00  0.00 0.39 1.31  0.30
Final Sat.:   528  880     0    0 1114   687    0    0     0  665 2260   520
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.41 0.41  0.00 0.00 0.19  0.19 0.00 0.00  0.00 0.12 0.12  0.12
Crit Moves:       ****                                             ****
Green/Cycle: 0.63 0.63  0.00 0.00 0.63  0.63 0.00 0.00  0.00 0.25 0.25  0.25
Volume/Cap:  0.65 0.65  0.00 0.00 0.30  0.30 0.00 0.00  0.00 0.48 0.48  0.48
Delay/Veh:    7.4  7.4   0.0  0.0  3.4   3.4  0.0  0.0   0.0 22.8 22.8  22.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   7.4  7.4   0.0  0.0  3.4   3.4  0.0  0.0   0.0 22.8 22.8  22.8
DesignQueue:    3    5     0    0    3     2    0    0     0    2    7     2
******************************************************************************
```

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```
------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                            AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #57 Dwight Way / Martin Luther King Way
******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.875
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       22.2
Optimal Cycle:       83              Level Of Service:                  C
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18   18   18    18   21   21    21    0    0     0
Lanes:       0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     62  690    66   88  868   163   68  419    83    0    0     0
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  62  690    66   88  868   163   68  419    83    0    0     0
Added Vol:     3    9     0    0   15    10    0  111    19    0    0     0
Future:       20   30    10   10  200    50   10   50    10    0    0     0
Initial Fut:  85  729    76   98 1083   223   78  580   112    0    0     0
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   85  729    76   98 1083   223   78  580   112    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  85  729    76   98 1083   223   78  580   112    0    0     0
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   85  729    76   98 1083   223   78  580   112    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.60 0.60  0.60 0.74 0.74  0.74 0.91 0.91  0.91 1.00 1.00  1.00
Lanes:      0.19 1.64  0.17 0.14 1.54  0.32 0.20 1.51  0.29 0.00 0.00  0.00
Final Sat.:  218 1874   195  195 2158   444  350 2601   502    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.39 0.39  0.39 0.50 0.50  0.50 0.22 0.22  0.22 0.00 0.00  0.00
Crit Moves:                      ****              ****
Green/Cycle: 0.53 0.53  0.53 0.53 0.53  0.53 0.30 0.30  0.30 0.00 0.00  0.00
Volume/Cap: 0.74 0.74  0.74 0.95 0.95  0.95 0.74 0.74  0.74 0.00 0.00  0.00
Delay/Veh:  13.2 13.2  13.2 25.4 25.4  25.4 26.9 26.9  26.9  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 13.2 13.2  13.2 25.4 25.4  25.4 26.9 26.9  26.9  0.0  0.0   0.0
DesignQueue:   2   14     1    2   22     5    2   17     3    0    0     0
******************************************************************************
```



```
------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                            AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #58 Dwight Way / Shattuck Avenue
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.914
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       16.3
Optimal Cycle:       89              Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0 1094   113   95  989     0   66  420   151    0    0     0
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0 1094   113   95  989     0   66  420   151    0    0     0
Added Vol:     0  210     0    1   26     0   36   75     0    0    0     0
Future:        0  130    30   10  110     0   20   50    10    0    0     0
Initial Fut:   0 1434   143  106 1125     0  122  545   161    0    0     0
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0 1434   143  106 1125     0  122  545   161    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0 1434   143  106 1125     0  122  545   161    0    0     0
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0 1434   143  106 1125     0  122  545   161    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 1.00 0.94  0.94 0.22 0.95  0.95 0.90 0.90  0.90 1.00 1.00  1.00
Lanes:      0.00 1.82  0.18 1.00 2.00  0.00 0.29 1.32  0.39 0.00 0.00  0.00
Final Sat.:    0 3237   323  424 3610     0  502 2240   662    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.44  0.44 0.25 0.31  0.00 0.24 0.24  0.24 0.00 0.00  0.00
Crit Moves:      ****         ****                   ****
Green/Cycle: 0.00 0.48  0.48 0.55 0.55  0.00 0.27 0.27  0.27 0.00 0.00  0.00
Volume/Cap: 0.00 0.91  0.91 0.46 0.57  0.00 0.91 0.91  0.91 0.00 0.00  0.00
Delay/Veh:   0.0 14.7  14.7 10.4  3.0   0.0 38.3 38.3  38.3  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  0.0 14.7  14.7 10.4  3.0   0.0 38.3 38.3  38.3  0.0  0.0   0.0
DesignQueue:   0   30     3    4   20     0    3   15     5    0    0     0
******************************************************************************
```

```
--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #59 Dwight Way / Fulton Street
********************************************************************************
Cycle (sec):        70               Critical Vol./Cap. (X):        0.492
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):       13.7
Optimal Cycle:      45               Level Of Service:                 B
********************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    21   21    0     0    0   16    16    0    0     0
Lanes:       0  0  0  0  1   2  0  0  0  0   0  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0    12  449    0     0    0  620     6    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0    12  449    0     0    0  620     6    0    0     0
Added Vol:     0    0     0    1    0     0    0   76     0    0    0     0
Future:        0    0    10   30    0     0    0   70    30    0    0     0
Initial Fut:   0    0    22  480    0     0    0  766    36    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0    22  480    0     0    0  766    36    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0    22  480    0     0    0  766    36    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0    22  480    0     0    0  766    36    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  0.87 0.59 1.00  1.00 1.00 0.94  0.94 1.00 1.00  1.00
Lanes:       0.00 0.00  1.00 2.00 0.00  0.00 0.00 1.91  0.09 0.00 0.00  0.00
Final Sat.:    0    0  1644 2260    0     0    0 3424   161    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.01 0.21 0.00  0.00 0.00 0.22  0.22 0.00 0.00  0.00
Crit Moves:                  ****                ****
Green/Cycle: 0.00 0.00  0.43 0.43 0.00  0.00 0.00 0.45  0.45 0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.03 0.49 0.00  0.00 0.00 0.49  0.49 0.00 0.00  0.00
Delay/Veh:    0.0  0.0  11.6 16.1  0.0   0.0  0.0 12.2  12.2  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0  11.6 16.1  0.0   0.0  0.0 12.2  12.2  0.0  0.0   0.0
DesignQueue:   0    0     0   11    0     0    0   17     1    0    0     0
********************************************************************************
```



```
--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #60 Dwight Way / Telegraph Avenue
********************************************************************************
Cycle (sec):        65               Critical Vol./Cap. (X):        0.762
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):       18.2
Optimal Cycle:      52               Level Of Service:                 B
********************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   15    15    0    0     0   17   17    17    0    0     0
Lanes:       0  0  1  1  0   0  0  0  0  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  697    78    0    0     0   66  479   565    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  697    78    0    0     0   66  479   565    0    0     0
Added Vol:     0   30     0    0    0     0   68    9     3    0    0     0
Future:        0   66    11    0    0     0   11   66    44    0    0     0
Initial Fut:   0  793    89    0    0     0  145  554   612    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  793    89    0    0     0  145  554   612    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  793    89    0    0     0  145  554   612    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  793    89    0    0     0  145  554   612    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.94  0.94 1.00 1.00  1.00 0.82 0.82  0.82 1.00 1.00  1.00
Lanes:       0.00 1.80  0.20 0.00 0.00  0.00 0.22 0.85  0.93 0.00 0.00  0.00
Final Sat.:    0 3197   359    0    0     0  345 1319  1458    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.25 0.00 0.00  0.00 0.42 0.42  0.42 0.00 0.00  0.00
Crit Moves:       ****                                ****
Green/Cycle: 0.00 0.33  0.33 0.00 0.00  0.00 0.55 0.55  0.55 0.00 0.00  0.00
Volume/Cap:  0.00 0.76  0.76 0.00 0.00  0.00 0.76 0.76  0.76 0.00 0.00  0.00
Delay/Veh:    0.0 23.7  23.7  0.0  0.0   0.0 14.5 14.5  14.5  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 23.7  23.7  0.0  0.0   0.0 14.5 14.5  14.5  0.0  0.0   0.0
DesignQueue:   0   21     2    0    0     0    3   10    11    0    0     0
********************************************************************************
```

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---------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
---------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #61 Dwight Way / College Avenue
*********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.538
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        12.3
Optimal Cycle:       39               Level Of Service:                  B
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   16    16    16   16     0    15   15    15     0    0     0
Lanes:       0  0  0  1  0    0  1  0  0  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  365    51    10  150     0    68  352    85     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  365    51    10  150     0    68  352    85     0    0     0
Added Vol:      0   64     0     0    4     0     7    2     0     0    0     0
Future:         0   50    10    20   90     0    20   20    10     0    0     0
Initial Fut:    0  479    61    30  244     0    95  374    95     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:     0  499    64    31  254     0    99  390    99     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  499    64    31  254     0    99  390    99     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  499    64    31  254     0    99  390    99     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.99  0.99  0.92 0.92  1.00  0.90 0.90  0.90  1.00 1.00  1.00
Lanes:       0.00 0.89  0.11  0.11 0.89  0.00  0.34 1.32  0.34  0.00 0.00  0.00
Final Sat.:     0 1660   211   192 1563     0   578 2276   578     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.30  0.30  0.16 0.16  0.00  0.17 0.17  0.17  0.00 0.00  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.00 0.56  0.56  0.56 0.56  0.00  0.32 0.32  0.32  0.00 0.00  0.00
Volume/Cap:  0.00 0.54  0.54  0.29 0.29  0.00  0.54 0.54  0.54  0.00 0.00  0.00
Delay/Veh:    0.0  8.0   8.0   5.8  5.8   0.0  19.6 19.6  19.6   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  8.0   8.0   5.8  5.8   0.0  19.6 19.6  19.6   0.0  0.0   0.0
DesignQueue:    0    9     1     1    4     0     3   10     3     0    0     0
*********************************************************************************
```



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---------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
---------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #62 Dwight Way / Piedmont Avenue / Warring Street
*********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.462
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        10.9
Optimal Cycle:       61               Level Of Service:                  B
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   22     0    29   29     0    24   24    24    24    0    24
Lanes:       0  0  1  1  0    0  1  1  0  0    1  0  1  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: 7:00 AM - 9:00 AM
Base Vol:       0  583     0     8  324     0    91  143   238    42    0    48
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  583     0     8  324     0    91  143   238    42    0    48
Added Vol:      0  179     0     0   17     0     0    0     2     0    0     0
Future:         0   77    11    11   44     0    11   11    33    11    0    11
Initial Fut:    0  839    11    19  385     0   102  154   273    53    0    59
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  839    11    19  385     0   102  154   273    53    0    59
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  839    11    19  385     0   102  154   273    53    0    59
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  839    11    19  385     0   102  154   273    53    0    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.95  0.86 0.86  1.00  0.71 1.00  0.85  0.77 1.00  0.77
Lanes:       0.00 1.97  0.03  0.09 1.91  0.00  1.00 1.00  1.00  0.47 0.00  0.53
Final Sat.:     0 3556    47   154 3120     0  1347 1900  1615   695    0   774
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.24  0.24  0.12 0.12  0.00  0.08 0.08  0.17  0.08 0.00  0.08
Crit Moves:       ****                                    ****
Green/Cycle: 0.00 0.51  0.51  0.51 0.51  0.00  0.37 0.37  0.37  0.37 0.00  0.37
Volume/Cap:  0.00 0.46  0.46  0.24 0.24  0.00  0.21 0.22  0.46  0.21 0.00  0.21
Delay/Veh:    0.0  8.6   8.6   7.1  7.1   0.0  14.9 14.8  18.1  14.9  0.0  14.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  8.6   8.6   7.1  7.1   0.0  14.9 14.8  18.1  14.9  0.0  14.9
DesignQueue:    0   16     0     0    7     0     2    4     6     1    0     1
*********************************************************************************
```

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-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
         2000 HCM Unsignalized Method (Future Volume Alternative)
*****************************************************************************
Intersection #63 Dwight Avenue / Prospect Street
*****************************************************************************
Average Delay (sec/veh):      6.3          Worst Case Level Of Service:     B
*****************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0    14    0   109   246   72     0     0   53    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    14    0   109   246   72     0     0   53    15
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0    0     0     0    0    20    30    0     0     0   20     0
Initial Fut:    0    0     0    14    0   129   276   72     0     0   73    15
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    14    0   129   276   72     0     0   73    15
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0    14    0   129   276   72     0     0   73    15
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   705 xxxx    81    88 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   406 xxxx   985  1520 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   339 xxxx   985  1520 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  830 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 10.2 xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx             10.2            xxxxxx           xxxxxx
ApproachLOS:        *                 B                *                *
```



```
-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
         2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #64 Adeline Street / Ward Avenue / Shattuck Avenue
*****************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.894
Loss Time (sec):      8 (Y+R =  6 sec) Average Delay (sec/veh):       20.0
Optimal Cycle:       80              Level Of Service:                  C
*****************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Permitted        Permitted        Protected        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   25    25     0   25    25    19    0    19     0    0     0
Lanes:       0  0  0  1  0    0  0  2  0  1    2  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0  784     3     0  736   546   723    0     4     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  784     3     0  736   546   723    0     4     0    0     0
Added Vol:      0  178     0     0   19     5    51    0     0     0    0     0
Future:         0   50     0     0   40    70   100    0     0     0    0     0
Initial Fut:    0 1012     3     0  795   621   874    0     4     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1012     3     0  795   621   874    0     4     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1012     3     0  795   621   874    0     4     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1012     3     0  795   621   874    0     4     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  1.00 0.95  0.85  0.92 1.00  0.85  1.00 1.00  1.00
Lanes:       0.00 0.99  0.01  0.00 2.00  1.00  2.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:     0 1894     6     0 3610  1615  3502    0  1615     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.53  0.53  0.00 0.22  0.38  0.25 0.00  0.00  0.00 0.00  0.00
Crit Moves:       ****                         ****
Green/Cycle: 0.00 0.58  0.58  0.00 0.58  0.58  0.29 0.00  0.29  0.00 0.00  0.00
Volume/Cap:  0.00 0.91  0.91  0.00 0.38  0.66  0.85 0.00  0.01  0.00 0.00  0.00
Delay/Veh:    0.0 24.9  24.9   0.0  7.7  12.7  30.7  0.0  16.4   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 24.9  24.9   0.0  7.7  12.7  30.7  0.0  16.4   0.0  0.0   0.0
DesignQueue:    0   18     0     0   13    10    24    0     0     0    0     0
*****************************************************************************
```

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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #65 Derby Street / Warring Street
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        1.582
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):     232.1
Optimal Cycle:        0              Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0    0  650    0   31   14   20    0    0   34  779
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   0    0    0  650    0   31   14   20    0    0   34  779
Added Vol:     0    0    0   18    0    0    0    0    0    0    0  179
Future:        0    0    0   90    0   10    0   10    0    0    0   90
Initial Fut:   0    0    0  758    0   41   14   30    0    0   34 1048
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    0    0    0  758    0   41   14   30    0    0   34 1048
Reduct Vol:    0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   0    0    0  758    0   41   14   30    0    0   34 1048
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    0    0    0  758    0   41   14   30    0    0   34 1048
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.00 0.00 0.00 0.95 0.00 0.05 0.32 0.68 0.00 0.00 0.03 0.97
Final Sat.:    0    0    0  574    0   31  166  355    0    0   21  663
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx xxxx 1.32 xxxx 1.32 0.08 0.08 xxxx xxxx 1.58 1.58
Crit Moves:                           ****      ****                ****
Delay/Veh:    0.0  0.0  0.0 174.6 0.0 174.6 10.5 10.5  0.0  0.0  284 283.6
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:   0.0  0.0  0.0 174.6 0.0 174.6 10.5 10.5  0.0  0.0  284 283.6
LOS by Move:   *    *    *    F    *    F    B    B    *    *    F    F
ApproachDel:     xxxxxx           174.6             10.5            283.6
Delay Adj:        xxxxx            1.00             1.00             1.00
ApprAdjDel:      xxxxxx           174.6             10.5            283.6
LOS by Appr:        *               F                B                F
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #66 Derby Street / Claremont Blvd.
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.728
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      28.3
Optimal Cycle:       61              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18    0   18    0    0    0    0   35   35   35   35    0
Lanes:       0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      5    0   64    0    0    0    0  665   12   52  813    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   5    0   64    0    0    0    0  665   12   52  813    0
Added Vol:     0    0    0    0    0    0    0   18    0    0  179    0
Future:        0    0    0    0    0    0    0  100    0    0   90    0
Initial Fut:   5    0   64    0    0    0    0  783   12   52 1082    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    5    0   64    0    0    0    0  783   12   52 1082    0
Reduct Vol:    0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   5    0   64    0    0    0    0  783   12   52 1082    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    5    0   64    0    0    0    0  783   12   52 1082    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  0.87 1.00 0.87 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.07 0.00 0.93 0.00 0.00 0.00 0.00 0.98 0.02 0.05 0.95 0.00
Final Sat.:   120    0 1536    0    0    0    0 1868   29   87 1813    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.00 0.04 0.00 0.00 0.00 0.00 0.42 0.42 0.60 0.60 0.00
Crit Moves:  ****                                                ****
Green/Cycle: 0.28 0.00 0.28 0.00 0.00 0.00 0.00 0.60 0.60 0.60 0.60 0.00
Volume/Cap:  0.15 0.00 0.15 0.00 0.00 0.00 0.00 0.70 0.70 1.00 1.00 0.00
Delay/Veh:   18.3  0.0 18.3  0.0  0.0  0.0  0.0 12.7 12.7 39.8 39.8  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  18.3  0.0 18.3  0.0  0.0  0.0  0.0 12.7 12.7 39.8 39.8  0.0
DesignQueue:   0    0    2    0    0    0    0   13    0    1   19    0
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #67 Ashby Avenue / Seventh Street

Cycle (sec): 95   Critical Vol./Cap. (X): 0.976
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 53.7
Optimal Cycle: 155   Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	4	19	19	4	19	19	4	22	22	4	20	20
Lanes:	0 1	0 1	0	0 1	0 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM												
Base Vol:	62	162	54	54	193	224	433	915	306	111	663	25
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	62	162	54	54	193	224	433	915	306	111	663	25
Added Vol:	0	0	0	0	0	0	0	94	0	0	11	0
Future:	100	70	20	60	20	30	50	60	40	50	60	30
Initial Fut:	162	232	74	114	213	254	483	1069	346	161	734	55
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	162	232	74	114	213	254	483	1069	346	161	734	55
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	162	232	74	114	213	254	483	1069	346	161	734	55
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	162	232	74	114	213	254	483	1069	346	161	734	55
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.55	0.55	0.55	0.85	0.85	0.85	0.95	0.91	0.91	0.95	0.94	0.94
Lanes:	0.69	0.99	0.32	0.39	0.73	0.88	1.00	1.51	0.49	1.00	1.86	0.14
Final Sat.:	721	1032	329	632	1180	1408	1805	2626	850	1805	3325	249
Capacity Analysis Module:												
Vol/Sat:	0.22	0.22	0.22	0.18	0.18	0.18	0.27	0.41	0.41	0.09	0.22	0.22
Crit Moves:		****							****		****	
Green/Cycle:	0.26	0.26	0.26	0.26	0.26	0.26	0.40	0.40	0.40	0.21	0.21	0.21
Volume/Cap:	0.87	0.86	0.86	0.70	0.70	0.70	0.66	1.02	1.02	0.42	1.07	1.07
Delay/Veh:	48.0	47.1	47.1	34.5	34.5	34.5	22.7	54.1	54.1	34.8	93.9	93.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	48.0	47.1	47.1	34.5	34.5	34.5	22.7	54.1	54.1	34.8	93.9	93.9
DesignQueue:	7	9	3	5	9	10	16	38	12	7	33	2

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #68 Ashby Avenue / San Pablo Avenue

Cycle (sec): 100   Critical Vol./Cap. (X): 0.972
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 42.1
Optimal Cycle: 163   Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	4	17	17	4	19	19	18	18	18	18	18	18
Lanes:	1 0	1 1	0	1 0	1 1	0	1 0	1 1	0	0 1	0 1	0
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM												
Base Vol:	173	521	53	137	741	128	84	584	134	51	613	135
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	173	521	53	137	741	128	84	584	134	51	613	135
Added Vol:	2	20	57	0	28	2	0	79	14	30	7	0
Future:	20	220	20	20	320	30	20	120	10	20	80	50
Initial Fut:	195	761	130	157	1089	160	104	783	158	101	700	185
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	195	761	130	157	1089	160	104	783	158	101	700	185
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	195	761	130	157	1089	160	104	783	158	101	700	185
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	195	761	130	157	1089	160	104	783	158	101	700	185
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.93	0.93	0.16	0.93	0.93	0.60	0.60	0.60
Lanes:	1.00	1.71	0.29	1.00	1.74	0.26	1.00	1.66	0.34	0.20	1.42	0.38
Final Sat.:	1805	3015	515	1805	3088	454	300	2929	591	233	1614	427
Capacity Analysis Module:												
Vol/Sat:	0.11	0.25	0.25	0.09	0.35	0.35	0.35	0.27	0.27	0.43	0.43	0.43
Crit Moves:	****				****						****	
Green/Cycle:	0.11	0.35	0.35	0.12	0.36	0.36	0.45	0.45	0.45	0.45	0.45	0.45
Volume/Cap:	0.97	0.72	0.72	0.72	0.97	0.97	0.78	0.60	0.60	0.97	0.97	0.97
Delay/Veh:	99.6	30.1	30.1	53.0	50.1	50.1	47.8	21.6	21.6	48.8	48.8	48.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	99.6	30.1	30.1	53.0	50.1	50.1	47.8	21.6	21.6	48.8	48.8	48.8
DesignQueue:	10	29	5	8	42	6	3	26	5	3	23	6

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #69 Ashby Avenue / Adeline Street

Cycle (sec): 140 Critical Vol./Cap. (X): 0.622
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 42.0
Optimal Cycle: 96 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Include			Include			Include			Include	
Min. Green:	4	38	38	6	38	38	4	22	22	4	32	32
Lanes:	1 0 1 1 0			1 0 2 1 0			1 0 1 1 0			1 0 1 1 0		
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	74	567	61	11	438	96	189	564	49	83	549	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	74	567	61	11	438	96	189	564	49	83	549	14
Added Vol:	4	8	0	0	1	4	43	78	1	0	19	0
Future:	30	50	10	10	10	50	50	110	20	10	190	0
Initial Fut:	108	625	71	21	449	150	282	752	70	93	758	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	108	625	71	21	449	150	282	752	70	93	758	14
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	108	625	71	21	449	150	282	752	70	93	758	14
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	108	625	71	21	449	150	282	752	70	93	758	14
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.88	0.88	0.95	0.94	0.94	0.95	0.95	0.95
Lanes:	1.00	1.80	0.20	1.00	2.25	0.75	1.00	1.83	0.17	1.00	1.96	0.04
Final Sat.:	1805	3193	363	1805	3744	1251	1805	3260	303	1805	3534	65
Capacity Analysis Module:												
Vol/Sat:	0.06	0.20	0.20	0.01	0.12	0.12	0.16	0.23	0.23	0.05	0.21	0.21
Crit Moves:	****				****		****				****	
Green/Cycle:	0.09	0.31	0.31	0.05	0.27	0.27	0.22	0.43	0.43	0.10	0.31	0.31
Volume/Cap:	0.70	0.64	0.64	0.24	0.44	0.44	0.70	0.53	0.53	0.53	0.70	0.70
Delay/Veh:	75.8	42.9	42.9	65.5	42.5	42.5	57.6	25.5	25.5	70.0	44.1	44.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	75.8	42.9	42.9	65.5	42.5	42.5	57.6	25.5	25.5	70.0	44.1	44.1
DesignQueue:	8	35	4	2	26	9	18	35	3	7	43	1

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #70 Ashby Avenue / Shattuck Avenue

Cycle (sec): 80 Critical Vol./Cap. (X): 0.566
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 16.7
Optimal Cycle: 53 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	21	21	21	6	21	21	20	20	20	20	20	20
Lanes:	0 1 0 1 0			0 1 0 1 0			0 1 0 1 0			0 1 0 1 0		
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	77	590	26	124	450	35	33	557	31	40	550	182
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	77	590	26	124	450	35	33	557	31	40	550	182
Added Vol:	0	104	0	2	11	6	58	20	0	0	13	16
Future:	30	20	10	20	10	10	10	110	10	10	150	10
Initial Fut:	107	714	36	146	471	51	101	687	41	50	713	208
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	107	714	36	146	471	51	101	687	41	50	713	208
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	107	714	36	146	471	51	101	687	41	50	713	208
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	107	714	36	146	471	51	101	687	41	50	713	208
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.25	1.67	0.08	0.44	1.41	0.15	0.24	1.66	0.10	0.10	1.47	0.43
Final Sat.:	474	3166	160	831	2679	290	463	3149	188	196	2790	814
Capacity Analysis Module:												
Vol/Sat:	0.23	0.23	0.23	0.18	0.18	0.18	0.22	0.22	0.22	0.26	0.26	0.26
Crit Moves:		****									****	
Green/Cycle:	0.40	0.40	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.45	0.45	0.45
Volume/Cap:	0.57	0.57	0.57	0.44	0.44	0.44	0.48	0.48	0.48	0.57	0.57	0.57
Delay/Veh:	20.2	20.2	20.2	18.5	18.5	18.5	13.8	13.8	13.8	14.8	14.8	14.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.2	20.2	20.2	18.5	18.5	18.5	13.8	13.8	13.8	14.8	14.8	14.8
DesignQueue:	3	20	1	4	13	1	3	18	1	1	19	5

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-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #71 Ashby Avenue / Telegraph Avenue
*******************************************************************************
Cycle (sec):        80              Critical Vol./Cap. (X):        0.907
Loss Time (sec):     12 (Y+R =  6 sec) Average Delay (sec/veh):      26.9
Optimal Cycle:     100              Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   21   21    21    0   21    21   25   25    25   25   25    25
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     150  985    80  148  623   103   86  549   120   89  573    83
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  150  985    80  148  623   103   86  549   120   89  573    83
Added Vol:      3   29     0    0    3     0    0   22     0    0   26     2
Future:        50   40    10   10   60    30   20   90    20   10   80    10
Initial Fut:  203 1054    90  158  686   133  106  661   140   99  679    95
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   203 1054    90  158  686   133  106  661   140   99  679    95
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  203 1054    90  158  686   133  106  661   140   99  679    95
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   203 1054    90  158  686   133  106  661   140   99  679    95
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.26 0.94  0.94 0.27 0.93  0.93 0.21 0.93  0.93 0.19 0.93  0.93
Lanes:       1.00 1.84  0.16 1.00 1.68  0.32 1.00 1.65  0.35 1.00 1.75  0.25
Final Sat.:   494 3286   281  515 2951   572  391 2902   615  363 3110   435
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.41 0.32  0.32 0.31 0.23  0.23 0.27 0.23  0.23 0.27 0.22  0.22
Crit Moves:  ****            ****                            ****
Green/Cycle: 0.43 0.43  0.43 0.53 0.53  0.53 0.32 0.32  0.32 0.32 0.32  0.32
Volume/Cap:  0.96 0.75  0.75 0.58 0.44  0.44 0.84 0.70  0.70 0.84 0.68  0.68
Delay/Veh:   73.8 22.6  22.6 21.9 12.4  12.4 69.7 26.6  26.6 73.3 25.9  25.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  73.8 22.6  22.6 21.9 12.4  12.4 69.7 26.6  26.6 73.3 25.9  25.9
DesignQueue:    5   29     2    6   15     3    3   21     4    3   22     3
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-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #72 Ashby Avenue / College Avenue
*******************************************************************************
Cycle (sec):        60              Critical Vol./Cap. (X):        1.161
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):      33.2
Optimal Cycle:     180              Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18   18   18    18   30   30    30   30   30    30
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      79  323    26  118  232    95   33  490    92    4  611   229
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   79  323    26  118  232    95   33  490    92    4  611   229
Added Vol:      0   18     0    3    2     0   18    4     0    0   28    28
Future:        20   20    10   20   20    60   20   80    10   10   20    30
Initial Fut:   99  361    36  141  254   155   71  574   102   14  659   287
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    99  361    36  141  254   155   71  574   102   14  659   287
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   99  361    36  141  254   155   71  574   102   14  659   287
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    99  361    36  141  254   155   71  574   102   14  659   287
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.81 0.81  0.81 0.73 0.73  0.73 0.84 0.84  0.84 0.95 0.95  0.95
Lanes:       0.20 0.73  0.07 0.26 0.46  0.28 0.09 0.77  0.14 0.01 0.69  0.30
Final Sat.:   306 1117   111  356  642   391  152 1229   218   26 1237   539
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.32 0.32  0.32 0.40 0.40  0.40 0.47 0.47  0.47 0.53 0.53  0.53
Crit Moves:                       ****                                ****
Green/Cycle: 0.38 0.38  0.38 0.45 0.45  0.45 0.53 0.53  0.53 0.54 0.54  0.54
Volume/Cap:  0.86 0.86  0.86 0.88 0.88  0.88 0.89 0.89  0.89 1.00 1.00  1.00
Delay/Veh:   31.5 31.5  31.5 28.8 28.8  28.8 26.3 26.3  26.3 41.9 41.9  41.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  31.5 31.5  31.5 28.8 28.8  28.8 26.3 26.3  26.3 41.9 41.9  41.9
DesignQueue:    2    8     1    3    5     3    1   10     2    0   12     5
*******************************************************************************
```

```
---------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
---------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #73 Ashby Avenue / Claremont Avenue
*********************************************************************************
Cycle (sec):         80              Critical Vol./Cap. (X):        0.828
Loss Time (sec):     12 (Y+R =  6 sec) Average Delay (sec/veh):       26.0
Optimal Cycle:       77              Level Of Service:                 C
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   16   16    16   16   16    16   28   28    28   28   28    28
Lanes:       0  1  0  1  0   1  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     35  288   153  321  272    59   43  504    13   90  637   429
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  35  288   153  321  272    59   43  504    13   90  637   429
Added Vol:     0    0     0   18    0     0    0    7     0    0   56   179
Future:       20   10    30   40   50    10   30   60    10   30   20    50
Initial Fut:  55  298   183  379  322    69   73  571    23  120  713   658
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   55  298   183  379  322    69   73  571    23  120  713   658
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  55  298   183  379  322    69   73  571    23  120  713   658
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   55  298   183  379  322    69   73  571    23  120  713   658
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
Lanes:      0.21 1.11  0.68 1.48 1.25  0.27 0.22 1.71  0.07 0.16 0.96  0.88
Final Sat.:  370 2007  1233 2665 2264   485  395 3090   124  291 1726  1593
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.15 0.15  0.15 0.14 0.14  0.14 0.18 0.18  0.18 0.41 0.41  0.41
Crit Moves: ****           ****                                   ****
Green/Cycle: 0.20 0.20  0.20 0.20 0.20  0.20 0.45 0.45  0.45 0.45 0.45  0.45
Volume/Cap: 0.74 0.74  0.74 0.71 0.71  0.71 0.41 0.41  0.41 0.92 0.92  0.92
Delay/Veh:  34.2 34.2  34.2 32.1 32.1  32.1 12.6 12.6  12.6 25.9 25.9  25.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 34.2 34.2  34.2 32.1 32.1  32.1 12.6 12.6  12.6 25.9 25.9  25.9
DesignQueue:    2   11     7   14   12     3    2   15     1    3   19    18
*********************************************************************************
```



```
---------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              AM Peak Hour
---------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #74 Tunnel Road / SR 13
*********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.820
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       16.8
Optimal Cycle:       61              Level Of Service:                 B
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include            Ovl
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  2  0  1   2  0  1  0  0   0  0  0  0  0   1  0  0  0  2
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0 1293   435  487  608     0    0    0     0  205    0   307
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0 1293   435  487  608     0    0    0     0  205    0   307
Added Vol:     0  235     0   13   12     0    0    0     0    0    0     0
Future:        0   80     0   60   70     0    0    0     0    0    0    20
Initial Fut:   0 1608   435  560  690     0    0    0     0  205    0   327
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0 1608   435  560  690     0    0    0     0  205    0   327
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0 1608   435  560  690     0    0    0     0  205    0   327
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0 1608   435  560  690     0    0    0     0  205    0   327
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 1.00 0.95  0.85 0.92 1.00  1.00 1.00 1.00  1.00 0.95 1.00  0.75
Lanes:      0.00 2.00  1.00 2.00 1.00  0.00 0.00 0.00  0.00 1.00 0.00  2.00
Final Sat.:    0 3610  1615 3502 1900     0    0    0     0 1805    0  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.45  0.27 0.16 0.36  0.00 0.00 0.00  0.00 0.11 0.00  0.12
Crit Moves:      ****      ****                                ****
Green/Cycle: 0.00 0.54  0.54 0.20 0.74  0.00 0.00 0.00  0.00 0.14 0.00  0.33
Volume/Cap: 0.00 0.82  0.50 0.82 0.49  0.00 0.00 0.00  0.00 0.82 0.00  0.34
Delay/Veh:   0.0 15.1   9.7 32.9  3.8   0.0  0.0  0.0   0.0 46.1  0.0  16.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  0.0 15.1   9.7 32.9  3.8   0.0  0.0  0.0   0.0 46.1  0.0  16.5
DesignQueue:    0   30     8   17    7     0    0    0     0    7    0     8
*********************************************************************************
```

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #167 Piedmont Avenue / Channing Way
********************************************************************************
Average Delay (sec/veh):     14.9          Worst Case Level Of Service:       F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      65  457    24    23  308    38    25   19    23    20   58    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   65  457    24    23  308    38    25   19    23    20   58    18
Added Vol:     35  132     0     0   12    42     0    0     5     0    0     0
Future:        11   78     4     4   52     6     4    3     4     3   10     3
Initial Fut:  111  667    28    27  372    86    29   22    32    23   68    21
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   111  667    28    27  372    86    29   22    32    23   68    21
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   111  667    28    27  372    86    29   22    32    23   68    21
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  458 xxxx xxxxx   695 xxxx xxxxx  1417 1386   415  1399 1415   681
Potent Cap.: 1114 xxxx xxxxx   910 xxxx xxxxx   116  144   642   119  139   454
Move Cap.:   1114 xxxx xxxxx   910 xxxx xxxxx    55  125   642    88  120   454
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  8.6 xxxx xxxxx   9.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  111 xxxxx  xxxx  128 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 99.8 xxxxx xxxxx  113 xxxxx
Shared LOS:     *    *     *     *    *     *     *    F     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx             99.8            113.0
ApproachLOS:        *                *                 F                F
```



```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1121 Highland Place / Heart Avenue / Cyclotron Road
********************************************************************************
Average Delay (sec/veh):      1.6          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       4    1     0    12    0    57    12  281     4     0   53     2
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    4    1     0    12    0    57    12  281     4     0   53     2
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         1    0     0     2    1     6     5   26     0     0  161    20
Initial Fut:    5    1     0    14    1    63    17  307     4     0  214    22
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     5    1     0    14    1    63    17  307     4     0  214    22
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     5    1     0    14    1    63    17  307     4     0  214    22
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx   7.1  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  600  579 xxxxx   568  570   225   236 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  416  429 xxxxx   436  434   819  1343 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    379  424 xxxxx   431  429   819  1343 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.7 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:  386 xxxx xxxxx  xxxx  698 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 14.5 xxxx xxxxx xxxxx 10.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:      14.5             10.8            xxxxxx           xxxxxx
ApproachLOS:        B                B                *                *
```

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1122 Stadium Rim Road / Canyon Road
********************************************************************************
Average Delay (sec/veh):      0.1          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    0  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  246     4     0  134     0     0    0     0     1    0     2
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  246     4     0  134     0     0    0     0     1    0     2
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0   43     1     0   23     0     0    0     0     0    0     0
Initial Fut:    0  289     5     0  157     0     0    0     0     1    0     2
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  289     5     0  157     0     0    0     0     1    0     2
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  289     5     0  157     0     0    0     0     1    0     2
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   449 xxxx   292
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   572 xxxx   752
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   572 xxxx   752
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  681 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 10.3 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    B     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            10.3
ApproachLOS:        *                *                *                B
```

2025 Baseline—P.M. Peak Hour

```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Marin Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):         90              Critical Vol./Cap. (X):        1.161
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):       95.0
Optimal Cycle:      180              Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     227 1022   114   169  659    18    18  656   137   145  736   154
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  227 1022   114   169  659    18    18  656   137   145  736   154
Added Vol:      5  106     3     1   18     0     0    3     1     1   18    19
Future:        30  209    50    90  221    28    27  181    10    47  163    90
Initial Fut:  262 1337   167   260  898    46    45  840   148   193  917   263
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   262 1337   167   260  898    46    45  840   148   193  917   263
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  262 1337   167   260  898    46    45  840   148   193  917   263
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   262 1337   167   260  898    46    45  840   148   193  917   263
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.94  0.94  0.95 0.93  0.93  0.95 0.92  0.92
Lanes:       1.00 1.78  0.22  1.00 1.90  0.10  1.00 1.70  0.30  1.00 1.55  0.45
Final Sat.:  1805 3155   394  1805 3410   175  1805 3002   529  1805 2713   778
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.42  0.42  0.14 0.26  0.26  0.02 0.28  0.28  0.11 0.34  0.34
Crit Moves:       ****        ****                   ****        ****
Green/Cycle: 0.17 0.37  0.37  0.12 0.32  0.32  0.02 0.24  0.24  0.09 0.31  0.31
Volume/Cap:  0.84 1.16  1.16  1.16 0.84  0.84  1.09 1.16  1.16  1.16 1.09  1.09
Delay/Veh:   53.3  110 110.0 149.9 34.2  34.2 211.7  120 119.6 160.6 86.1  86.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  53.3  110 110.0 149.9 34.2  34.2 211.7  120 119.6 160.6 86.1  86.1
DesignQueue:   11   47     6    12   33     2     2   34     6     9   34    10
********************************************************************************
```



```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Marin Avenue / The Alameda
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.869
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       22.3
Optimal Cycle:       75              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   25   25   25    25   25   25    23   23   23    23   23   23
Lanes:       0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     316  322     1    43  178    77    50  534   193    17  480    69
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  316  322     1    43  178    77    50  534   193    17  480    69
Added Vol:     21    0     5     0    0     0     0    5     1     1   16     0
Future:       130  110    10    10   30    70    20  200    80    10   70    10
Initial Fut:  467  432    16    53  208   147    70  739   274    28  566    79
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   467  432    16    53  208   147    70  739   274    28  566    79
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  467  432    16    53  208   147    70  739   274    28  566    79
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   467  432    16    53  208   147    70  739   274    28  566    79
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.61 0.61  0.61  0.70 0.70  0.70  0.78 0.78  0.78  0.80 0.80  0.80
Lanes:       1.00 0.96  0.04  0.26 1.02  0.72  0.13 1.36  0.51  0.08 1.69  0.23
Final Sat.:  1152 1111    41   348 1365   965   192 2031   753   126 2552   356
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.41 0.39  0.39  0.15 0.15  0.15  0.36 0.36  0.36  0.22 0.22  0.22
Crit Moves:  ****                                    ****
Green/Cycle: 0.47 0.47  0.47  0.47 0.47  0.47  0.42 0.42  0.42  0.42 0.42  0.42
Volume/Cap:  0.87 0.83  0.83  0.33 0.33  0.33  0.87 0.87  0.87  0.53 0.53  0.53
Delay/Veh:   26.4 23.7  23.7  12.4 12.4  12.4  26.9 26.9  26.9  16.8 16.8  16.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.4 23.7  23.7  12.4 12.4  12.4  26.9 26.9  26.9  16.8 16.8  16.8
DesignQueue:   10   10     0     1    4     3     2   18     7     1   13     2
********************************************************************************
```

```
-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #3 Gilman Street / Sixth Street
*******************************************************************************
Cycle (sec):         70                Critical Vol./Cap. (X):        1.267
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       128.7
Optimal Cycle:      180                Level Of Service:                  F
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    19   19    19    19   19    19    19   19    19    19   19    19
Lanes:        0  0  1! 0  0   0  1  0  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     346   46   159    24   47    52    28  497   109    53  489    11
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  346   46   159    24   47    52    28  497   109    53  489    11
Added Vol:      9    0     0     0    0     0     0    0     2     0    1     0
PasserByVol:  120    0    93    20   90     0     0  193   180   122   41     0
Initial Fut:  475   46   252    44  137    52    28  690   291   175  531    11
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   475   46   252    44  137    52    28  690   291   175  531    11
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  475   46   252    44  137    52    28  690   291   175  531    11
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   475   46   252    44  137    52    28  690   291   175  531    11
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.96 0.65  0.65  0.79 0.79  0.79  0.94 0.94  0.94  0.61 0.61  0.61
Lanes:       0.52 0.07  0.41  0.38 1.17  0.45  0.03 0.68  0.29  0.24 0.74  0.02
Final Sat.:   946   92   502   564 1755   666    49 1216   513   282  857    18
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.50 0.50  0.50  0.08 0.08  0.08  0.57 0.57  0.57  0.62 0.62  0.62
Crit Moves:       ****                                               ****
Green/Cycle: 0.27 0.27  0.31  0.31 0.31  0.31  0.63 0.63  0.63  0.63 0.63  0.63
Volume/Cap:  1.85 1.85  1.60  0.25 0.25  0.25  0.90 0.90  0.90  0.99 0.99  0.99
Delay/Veh:  417.0  417 302.4  18.5 18.5  18.5  22.9 22.9  22.9  42.9 42.9  42.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 417.0  417 302.4  18.5 18.5  18.5  22.9 22.9  22.9  42.9 42.9  42.9
DesignQueue:   15    1     7     1    4     1     0   12     5     3    9     0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #4 Gilman Street / San Pablo Avenue
*******************************************************************************
Cycle (sec):        100                Critical Vol./Cap. (X):        1.066
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):        67.8
Optimal Cycle:      180                Level Of Service:                  E
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     4   35    35     4   35    35    31   31    31    31   31    31
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     140 1057    87   126  830   112   174  345   155    40  233    82
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  140 1057    87   126  830   112   174  345   155    40  233    82
Added Vol:      1  114     0     0   19     0     0    0     0     0    0     0
PasserByVol:   60  183    40    20  180    30   107   50   120    10   30    44
Initial Fut:  201 1354   127   146 1029   142   281  395   275    50  263   126
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   201 1354   127   146 1029   142   281  395   275    50  263   126
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  201 1354   127   146 1029   142   281  395   275    50  263   126
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   201 1354   127   146 1029   142   281  395   275    50  263   126
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.57 0.57  0.57  0.67 0.67  0.67
Lanes:       1.00 1.83  0.17  1.00 1.76  0.24  0.59 0.83  0.58  0.11 0.60  0.29
Final Sat.:  1805 3258   306  1805 3115   430   636  894   622   146  768   368
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.42  0.42  0.08 0.33  0.33  0.44 0.44  0.44  0.34 0.34  0.34
Crit Moves:       ****        ****                   ****
Green/Cycle: 0.12 0.39  0.39  0.08 0.35  0.35  0.41 0.41  0.41  0.41 0.41  0.41
Volume/Cap:  0.96 1.07  1.07  1.07 0.94  0.94  1.07 1.07  1.07  0.83 0.83  0.83
Delay/Veh:   97.4 74.5  74.5 142.0 46.8  46.8  78.7 78.7  78.7  39.8 39.8  39.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  97.4 74.5  74.5 142.0 46.8  46.8  78.7 78.7  78.7  39.8 39.8  39.8
DesignQueue:   10   51     5     8   40     6    10   14    10     2    9     4
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Rose Street / Shattuck Avenue
********************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.759
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        16.2
Optimal Cycle:       52               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    17   17    17    17   17    17    27   27    27    27   27    27
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     159  641    14   112  444    26    69  253    49    29  214   228
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  159  641    14   112  444    26    69  253    49    29  214   228
Added Vol:      0    8     0     1    1     0     0    0     0     0    0     4
Future:        60  230    20    10  220    10    10   10    30    20   10    10
Initial Fut:  219  879    34   123  665    36    79  263    79    49  224   242
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   219  879    34   123  665    36    79  263    79    49  224   242
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  219  879    34   123  665    36    79  263    79    49  224   242
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   219  879    34   123  665    36    79  263    79    49  224   242
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.32 0.94  0.94  0.23 0.94  0.94  0.77 0.77  0.85  0.88 0.88  0.88
Lanes:       1.00 1.93  0.07  1.00 1.90  0.10  0.23 0.77  1.00  0.10 0.43  0.47
Final Sat.:   602 3455   134   429 3397   184   338 1125  1615   159  726   784
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.36 0.25  0.25  0.29 0.20  0.20  0.23 0.23  0.05  0.31 0.31  0.31
Crit Moves:  ****                                                    ****
Green/Cycle: 0.48 0.48  0.48  0.48 0.48  0.48  0.41 0.41  0.41  0.41 0.41  0.41
Volume/Cap:  0.76 0.53  0.53  0.60 0.41  0.41  0.57 0.57  0.12  0.76 0.76  0.76
Delay/Veh:   26.0 13.1  13.1  18.1 12.0  12.0  17.5 17.5  13.0  22.8 22.8  22.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.0 13.1  13.1  18.1 12.0  12.0  17.5 17.5  13.0  22.8 22.8  22.8
DesignQueue:    5   19     1     3   14     1     2    6     2     1    6     6
********************************************************************************
```



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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #6 Cedar Street / Martin Luther King Way
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        1.083
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):        50.7
Optimal Cycle:      180               Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    20   20    20    20   20    20    20   20    20    20   20    20
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      53  614    65    30  541    12    20  297    57    68  296    65
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   53  614    65    30  541    12    20  297    57    68  296    65
Added Vol:      2   22     4     0    2     0     0    2     0     1   11     0
Future:        20  210    30    20   80    10    10  110    10    10   30    10
Initial Fut:   75  846    99    50  623    22    30  409    67    79  337    75
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    75  846    99    50  623    22    30  409    67    79  337    75
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   75  846    99    50  623    22    30  409    67    79  337    75
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    75  846    99    50  623    22    30  409    67    79  337    75
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.90 0.90  0.90  0.88 0.88  0.88  0.93 0.93  0.93  0.73 0.73  0.73
Lanes:       0.07 0.83  0.10  0.07 0.90  0.03  0.06 0.81  0.13  0.16 0.69  0.15
Final Sat.:   125 1415   166   121 1505    53   105 1433   235   224  956   213
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.60 0.60  0.60  0.41 0.41  0.41  0.29 0.29  0.29  0.35 0.35  0.35
Crit Moves:       ****                                                    ****
Green/Cycle: 0.55 0.55  0.55  0.55 0.55  0.55  0.33 0.33  0.33  0.33 0.33  0.33
Volume/Cap:  1.08 1.08  1.08  0.75 0.75  0.75  0.88 0.88  0.88  1.08 1.08  1.08
Delay/Veh:   64.5 64.5  64.5  13.1 13.1  13.1  37.8 37.8  37.8  88.6 88.6  88.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  64.5 64.5  64.5  13.1 13.1  13.1  37.8 37.8  37.8  88.6 88.6  88.6
DesignQueue:    1   16     2     1   11     0     1   11     2     2    9     2
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #7 Cedar Street / Shattuck Avenue

Cycle (sec): 65   Critical Vol./Cap. (X): 0.763
Loss Time (sec): 8 (Y+R = 5 sec) Average Delay (sec/veh): 16.7
Optimal Cycle: 52   Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	20	20	20	20	20	20	22	22	22	22	22	22
Lanes:	1 0 1 1 0			1 0 1 1 0			1 0 0 1 0			1 0 0 1 0		
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	138	795	56	144	619	72	86	275	67	59	341	150
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	138	795	56	144	619	72	86	275	67	59	341	150
Added Vol:	0	6	0	0	1	0	0	6	0	1	12	1
Future:	20	230	40	20	210	10	10	80	40	60	20	40
Initial Fut:	158	1031	96	164	830	82	96	361	107	120	373	191
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	158	1031	96	164	830	82	96	361	107	120	373	191
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	158	1031	96	164	830	82	96	361	107	120	373	191
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	158	1031	96	164	830	82	96	361	107	120	373	191
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.31	0.94	0.94	0.24	0.94	0.94	0.18	0.97	0.97	0.24	0.95	0.95
Lanes:	1.00	1.83	0.17	1.00	1.82	0.18	1.00	0.77	0.23	1.00	0.66	0.34
Final Sat.:	595	3260	304	460	3243	320	346	1416	420	462	1192	611
Capacity Analysis Module:												
Vol/Sat:	0.27	0.32	0.32	0.36	0.26	0.26	0.28	0.25	0.25	0.26	0.31	0.31
Crit Moves:				****							****	
Green/Cycle:	0.54	0.53	0.53	0.53	0.53	0.53	0.34	0.34	0.34	0.34	0.34	0.34
Volume/Cap:	0.49	0.60	0.60	0.67	0.48	0.48	0.82	0.75	0.75	0.77	0.92	0.92
Delay/Veh:	7.5	4.0	4.0	16.5	3.2	3.2	64.7	27.3	27.3	48.9	42.6	42.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	7.5	4.0	4.0	16.5	3.2	3.2	64.7	27.3	27.3	48.9	42.6	42.6
DesignQueue:	3	19	2	3	15	1	2	9	3	3	10	5

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 Cedar Street / Oxford Street

Cycle (sec): 65   Critical Vol./Cap. (X): 1.102
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 62.3
Optimal Cycle: 180   Level Of Service: E

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	16	16	16	16	16	16	16	16	16	16	16	16
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	91	464	81	17	196	17	18	307	57	61	340	31
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	91	464	81	17	196	17	18	307	57	61	340	31
Added Vol:	15	112	0	0	14	2	4	0	2	0	-3	0
future:	40	80	20	10	10	0	20	120	40	50	100	10
Initial Fut:	146	656	101	27	220	19	42	427	99	111	437	41
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	146	656	101	27	220	19	42	427	99	111	437	41
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	146	656	101	27	220	19	42	427	99	111	437	41
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	146	656	101	27	220	19	42	427	99	111	437	41
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.88	0.88	0.88	0.89	0.89	0.89	0.91	0.91	0.91	0.72	0.72	0.72
Lanes:	0.16	0.73	0.11	0.10	0.83	0.07	0.07	0.76	0.17	0.19	0.74	0.07
Final Sat.:	271	1218	188	173	1406	121	128	1306	303	259	1021	96
Capacity Analysis Module:												
Vol/Sat:	0.54	0.54	0.54	0.16	0.16	0.16	0.33	0.33	0.33	0.43	0.43	0.43
Crit Moves:		****									****	
Green/Cycle:	0.49	0.49	0.49	0.49	0.49	0.49	0.39	0.39	0.39	0.39	0.39	0.39
Volume/Cap:	1.10	1.10	1.10	0.32	0.32	0.32	0.84	0.84	0.84	1.10	1.10	1.10
Delay/Veh:	79.8	79.8	79.8	11.1	11.1	11.1	30.2	30.2	30.2	89.7	89.7	89.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	79.8	79.8	79.8	11.1	11.1	11.1	30.2	30.2	30.2	89.7	89.7	89.7
DesignQueue:	3	14	2	1	4	0	1	10	2	3	11	1

```
---------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  PM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #9 Cedar Street / Euclid Avenue
*********************************************************************************
Cycle (sec):         60              Critical Vol./Cap. (X):        0.637
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       14.0
Optimal Cycle:       42              Level Of Service:                 B
*********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   17   17   17    17   17   17    17   17   17    17   17    0
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     90  226   29     7  127   44    51  180   49    18   91    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  90  226   29     7  127   44    51  180   49    18   91    0
Added Vol:     0    3    0     0    1    0     3    0    0     0   -2    0
Future:       50   30    0     0   10   20    40  100   40    10   70    0
Initial Fut: 140  259   29     7  138   64    94  280   89    28  159    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:  140  259   29     7  138   64    94  280   89    28  159    0
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol: 140  259   29     7  138   64    94  280   89    28  159    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:  140  259   29     7  138   64    94  280   89    28  159    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.82 0.82 0.82  0.95 0.95 0.95  0.87 0.87 0.87  0.91 0.91 1.00
Lanes:       0.33 0.60 0.07  0.03 0.66 0.31  0.20 0.61 0.19  0.15 0.85 0.00
Final Sat.:   512  948  106    60 1186  550   337 1004  319   259 1468    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.27 0.27 0.27  0.12 0.12 0.12  0.28 0.28 0.28  0.11 0.11 0.00
Crit Moves:       ****                            ****
Green/Cycle: 0.43 0.43 0.43  0.43 0.43 0.43  0.44 0.44 0.44  0.44 0.44 0.00
Volume/Cap:  0.64 0.64 0.64  0.27 0.27 0.27  0.64 0.64 0.64  0.25 0.25 0.00
Delay/Veh:   15.5 15.5 15.5  11.3 11.3 11.3  15.0 15.0 15.0  10.8 10.8  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  15.5 15.5 15.5  11.3 11.3 11.3  15.0 15.0 15.0  10.8 10.8  0.0
DesignQueue:    3    5    1     0    3    1     2    6    2     1    3    0
*********************************************************************************
```



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---------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  PM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
*********************************************************************************
Intersection #10 Grizzly Peak Blvd / Centennial Drive
*********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.882
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       23.2
Optimal Cycle:        0              Level Of Service:                 C
*********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:    162   65  250    33   30    8     3  159   45    22  111   25
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse: 162   65  250    33   30    8     3  159   45    22  111   25
Added Vol:     0    0   25     0    0    0     0    0    0     4    0    0
Future:       11    0   33     0    0    0     0   22   22    11   11    0
Initial Fut: 173   65  308    33   30    8     3  181   67    37  122   25
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90
PHF Volume:  192   72  342    37   33    9     3  201   74    41  136   28
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol: 192   72  342    37   33    9     3  201   74    41  136   28
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:  192   72  342    37   33    9     3  201   74    41  136   28
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.32 0.12 0.56  0.47 0.42 0.11  0.01 0.72 0.27  0.20 0.66 0.14
Final Sat.:  218   82  388   238  216   58     7  411  152   109  360   74
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.88 0.88 0.88  0.15 0.15 0.15  0.49 0.49 0.49  0.38 0.38 0.38
Crit Moves:       ****                  ****       ****        ****
Delay/Veh:   32.7 32.7 32.7  10.4 10.4 10.4  13.9 13.9 13.9  12.5 12.5 12.5
Delay Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  32.7 32.7 32.7  10.4 10.4 10.4  13.9 13.9 13.9  12.5 12.5 12.5
LOS by Move:    D    D    D     B    B    B     B    B    B     B    B    B
ApproachDel:      32.7             10.4             13.9             12.5
Delay Adj:        1.00             1.00             1.00             1.00
ApprAdjDel:       32.7             10.4             13.9             12.5
LOS by Appr:        D                B                B                B
*********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Hearst Avenue / Shattuck Avenue

Cycle (sec): 75 Critical Vol./Cap. (X): 0.895
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 23.9
Optimal Cycle: 86 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	22	22	22	22	22	22	22	22	22	22	22	22
Lanes:	1 0 1 1 0			1 0 1 1 0			0 1 0 1 0			0 1 0 1 0		
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	34	715	63	117	537	54	67	232	20	122	321	136
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	34	715	63	117	537	54	67	232	20	122	321	136
Added Vol:	22	6	-2	0	2	0	0	4	3	-2	33	0
Future:	22	176	33	66	264	44	55	22	22	55	22	99
Initial Fut:	78	897	94	183	803	98	122	258	45	175	376	235
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	78	897	94	183	803	98	122	258	45	175	376	235
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	78	897	94	183	803	98	122	258	45	175	376	235
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	78	897	94	183	803	98	122	258	45	175	376	235
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.24	0.94	0.94	0.20	0.93	0.93	0.54	0.54	0.54	0.65	0.65	0.65
Lanes:	1.00	1.81	0.19	1.00	1.78	0.22	0.57	1.22	0.21	0.44	0.96	0.60
Final Sat.:	458	3222	338	380	3166	386	591	1251	218	551	1184	740
Capacity Analysis Module:												
Vol/Sat:	0.17	0.28	0.28	0.48	0.25	0.25	0.21	0.21	0.21	0.32	0.32	0.32
Crit Moves:				****							****	
Green/Cycle:	0.41	0.41	0.41	0.41	0.41	0.41	0.39	0.39	0.39	0.39	0.39	0.39
Volume/Cap:	0.42	0.68	0.68	1.18	0.62	0.62	0.53	0.53	0.53	0.82	0.82	0.82
Delay/Veh:	15.3	12.5	12.5	141.0	11.5	11.5	20.2	20.2	20.2	28.3	28.3	28.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.3	12.5	12.5	141.0	11.5	11.5	20.2	20.2	20.2	28.3	28.3	28.3
DesignQueue:	2	24	2	5	21	3	3	7	1	5	10	6

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #12 Hearst Avenue / Oxford Avenue

Cycle (sec): 75 Critical Vol./Cap. (X): 0.986
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 50.1
Optimal Cycle: 144 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	19	19	19	19	19	19	22	22	22	22	22	22
Lanes:	1 0 1 1 0			0 1 0 1 0			0 1 0 1 0			1 1 0 1 0		
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	80	743	315	30	458	25	23	267	115	313	478	52
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	80	743	315	30	458	25	23	267	115	313	478	52
Added Vol:	-1	103	5	17	48	24	2	1	0	9	9	2
Future:	33	121	44	11	77	22	0	88	44	44	1232	11
Initial Fut:	112	967	364	58	583	71	25	356	159	366	1719	65
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	112	967	364	58	583	71	25	356	159	366	1719	65
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	112	967	364	58	583	71	25	356	159	366	1719	65
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	112	967	364	58	583	71	25	356	159	366	1719	65
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.17	0.91	0.91	0.89	0.89	0.89	0.87	0.87	0.87	0.95	0.95	0.95
Lanes:	1.00	1.45	0.55	0.16	1.64	0.20	0.09	1.32	0.59	1.00	1.93	0.07
Final Sat.:	319	2515	947	277	2781	339	153	2173	970	1798	3465	131
Capacity Analysis Module:												
Vol/Sat:	0.35	0.38	0.38	0.21	0.21	0.21	0.16	0.16	0.16	0.20	0.50	0.50
Crit Moves:		****									****	
Green/Cycle:	0.32	0.32	0.32	0.32	0.32	0.32	0.58	0.58	0.58	0.58	0.58	0.58
Volume/Cap:	1.10	1.21	1.21	0.66	0.66	0.66	0.28	0.28	0.28	0.35	0.86	0.86
Delay/Veh:	144.8	128	127.5	24.6	24.6	24.6	8.5	8.5	8.5	8.7	17.7	17.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	144.8	128	127.5	24.6	24.6	24.6	8.5	8.5	8.5	8.7	17.7	17.7
DesignQueue:	3	30	11	2	17	2	0	7	3	7	35	1

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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #13 Hearst Avenue / Spruce Street
*******************************************************************************
Average Delay (sec/veh):      1.0          Worst Case Level Of Service:       C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  1  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0    11    0    48    34  579     0     0  792    13
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    11    0    48    34  579     0     0  792    13
Added Vol:      0    0     0     0    0     0     0   22     0     0   21     0
Future:         0    0     0     0    0    20     0  130     0     0  170     0
Initial Fut:    0    0     0    11    0    68    34  731     0     0  983    13
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    11    0    68    34  731     0     0  983    13
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0    11    0    68    34  731     0     0  983    13
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1423 xxxx   498   996 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   129 xxxx   523   703 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   124 xxxx   523   703 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.4 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     B    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  362 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 17.7 xxxxx  10.4 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    C     *     B    *     *     *    *     *
ApproachDel:     xxxxxx            17.7             xxxxxx           xxxxxx
ApproachLOS:        *                C                *                *
```



```
-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #14 Hearst Avenue / Arch Street / Le Conte Avenue
*******************************************************************************
Average Delay (sec/veh):      2.9          Worst Case Level Of Service:       C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0     6    0   135   146  439     0     0  668     6
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     6    0   135   146  439     0     0  668     6
Added Vol:      0    0     0     0    0     0     3   19     0     0   21     0
Future:         0    0     0     0    0    40    50  100     0     0  150     0
Initial Fut:    0    0     0     6    0   175   199  558     0     0  839     6
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0     6    0   175   199  558     0     0  839     6
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0     6    0   175   199  558     0     0  839     6
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1519 xxxx   422   845 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   112 xxxx   585   800 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx    90 xxxx   585   800 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  11.0 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     B    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  495 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 16.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    C     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            16.4             xxxxxx           xxxxxx
ApproachLOS:        *                C                *                *
```

```
-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
             Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
         2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #15 Hearst Avenue / Scenic Avenue
*******************************************************************************
Average Delay (sec/veh):      1.3          Worst Case Level Of Service:       B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  0  0  1    0  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00-6:00 PM
Base Vol:        0    0     0     0    0   109     0  437     0     0  566    54
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0     0    0   109     0  437     0     0  566    54
Added Vol:       0    0     0     0    0    11     0    0     0     0   10     0
Future:          0    0     0     0    0    30     0  100     0     0  140    10
Initial Fut:     0    0     0     0    0   150     0  537     0     0  716    64
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0     0    0   150     0  537     0     0  716    64
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0     0    0   150     0  537     0     0  716    64
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx   390  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx   614  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx   614  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx  12.7 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     B     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx             12.7           xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```



```
-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
             Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #16 Hearst Avenue / Euclid Avenue
*******************************************************************************
Cycle (sec):          80               Critical Vol./Cap. (X):        0.598
Loss Time (sec):      12 (Y+R =  3 sec) Average Delay (sec/veh):       16.3
Optimal Cycle:        53               Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:      0    0     0    25    0    25     5   16     0    16   16    16
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:        4    0     1    57    0   115   120  307     0     2  503    23
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     4    0     1    57    0   115   120  307     0     2  503    23
Added Vol:       0    0     0     0    0     0     0   19     0     0   -1     3
Future:          0    0     0    11    0    44    44   88     0     0  143    11
Initial Fut:     4    0     1    68    0   159   164  414     0     2  645    37
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      4    0     1    68    0   159   164  414     0     2  645    37
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:     4    0     1    68    0   159   164  414     0     2  645    37
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:      4    0     1    68    0   159   164  414     0     2  645    37
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.86 1.00  0.86  0.82 1.00  0.82  0.56 1.00  1.00  0.99 0.99  0.99
Lanes:        0.80 0.00  0.20  0.30 0.00  0.70  1.00 1.00  0.00  0.01 0.94  0.05
Final Sat.:   1306    0   326   467    0  1091  1058 1900     0     6 1779   102
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.00  0.00  0.15 0.00  0.15  0.15 0.22  0.00  0.36 0.36  0.36
Crit Moves:                    ****                                   ****
Green/Cycle:  0.31 0.00  0.31  0.31 0.00  0.31  0.54 0.54  0.00  0.54 0.54  0.54
Volume/Cap:   0.01 0.00  0.01  0.47 0.00  0.47  0.29 0.41  0.00  0.67 0.67  0.67
Delay/Veh:    19.0  0.0  19.0  25.3  0.0  25.3  11.4 12.1   0.0  17.0 17.0  17.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   19.0  0.0  19.0  25.3  0.0  25.3  11.4 12.1   0.0  17.0 17.0  17.0
DesignQueue:     0    0     0     2    0     5     3    9     0     0   15     1
*******************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
         2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #17 Hearst Avenue / Le Roy Avenue
********************************************************************************
Average Delay (sec/veh):      1.5          Worst Case Level Of Service:        C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:       0    0     0   12    0    56   38  355     0     0  523    21
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   12    0    56   38  355     0     0  523    21
Added Vol:      0    0     0    0    0     0    0   20     0     0    2     0
Future:         0    0     0    0    0    10   20   90     0     0  140    10
Initial Fut:    0    0     0   12    0    66   58  465     0     0  665    31
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   12    0    66   58  465     0     0  665    31
Reduct Vol:     0    0     0    0    0     0    0    0     0     0    0     0
Final Vol.:     0    0     0   12    0    66   58  465     0     0  665    31
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1242 xxxx   681   696 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   183 xxxx   454   909 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   174 xxxx   454   909 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.2 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  364 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 17.6 xxxxx   9.2 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    C     *     A    *     *     *    *     *
ApproachDel:     xxxxxx             17.6            xxxxxx           xxxxxx
ApproachLOS:        *                 C                *                *
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #18 Hearst Avenue / Gayley Road / LaLoma Avenue
********************************************************************************
Cycle (sec):         70                Critical Vol./Cap. (X):        1.071
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        57.2
Optimal Cycle:      180                Level Of Service:                  E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    17   17    17    17   17    17
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     318  288    19     4  203    49    28   52   288    69  197    40
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  318  288    19     4  203    49    28   52   288    69  197    40
Added Vol:      2   28     0     0   12     0     0    0    20     0    0     0
Future:        99   33    11     0    0    22    22   33    66    11   66    11
Initial Fut:  419  349    30     4  215    71    50   85   374    80  263    51
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   419  349    30     4  215    71    50   85   374    80  263    51
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  419  349    30     4  215    71    50   85   374    80  263    51
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   419  349    30     4  215    71    50   85   374    80  263    51
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.68 0.68  0.68  0.96 0.96  0.96  0.80 0.80  0.80  0.72 0.72  0.85
Lanes:       0.52 0.44  0.04  0.01 0.75  0.24  0.10 0.17  0.73  0.23 0.77  1.00
Final Sat.:   682  568    49    25 1353   447   149  254  1118   319 1049  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.61 0.61  0.61  0.16 0.16  0.16  0.33 0.33  0.33  0.25 0.25  0.03
Crit Moves:       ****                              ****
Green/Cycle: 0.57 0.57  0.57  0.57 0.57  0.57  0.31 0.31  0.31  0.31 0.31  0.31
Volume/Cap:  1.07 1.07  1.07  0.28 0.28  0.28  1.07 1.07  1.07  0.80 0.80  0.10
Delay/Veh:   68.7 68.7  68.7   8.2  8.2   8.2  85.2 85.2  85.2  36.3 36.3  17.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  68.7 68.7  68.7   8.2  8.2   8.2  85.2 85.2  85.2  36.3 36.3  17.1
DesignQueue:    8    7     1     0    4     1     1    2    11     2    7     1
********************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #19 Berkeley Way / Oxford Street
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.557
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        9.9
Optimal Cycle:       46              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    18   18   18    18   18   18    20   20   20    20   20   20
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      48 1039    3     4  890   22    72    2   51    29   18   42
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   48 1039    3     4  890   22    72    2   51    29   18   42
Added Vol:      5   84    0     0   53    3    23    0   34     0    0    0
Future:        20  160    0     0  170    0    10    0   10    20    0   10
Initial Fut:   73 1283    3     4 1113   25   105    2   95    49   18   52
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    73 1283    3     4 1113   25   105    2   95    49   18   52
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   73 1283    3     4 1113   25   105    2   95    49   18   52
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:    73 1283    3     4 1113   25   105    2   95    49   18   52
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.20 0.95 0.95  0.16 0.95 0.95  0.75 0.75 0.75  0.75 0.89 0.89
Lanes:       1.00 1.99 0.01  1.00 1.96 0.04  0.52 0.01 0.47  1.00 0.26 0.74
Final Sat.:   374 3602    8   296 3520   79   741   14  671  1423  434 1255
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.20 0.36 0.36  0.01 0.32 0.32  0.14 0.14 0.14  0.03 0.04 0.04
Crit Moves:       ****                            ****
Green/Cycle: 0.63 0.63 0.63  0.63 0.63 0.63  0.27 0.27 0.27  0.27 0.27 0.27
Volume/Cap:  0.31 0.57 0.57  0.02 0.50 0.50  0.53 0.53 0.53  0.13 0.16 0.16
Delay/Veh:    7.3  8.5  8.5   5.3  7.8  7.8  24.9 24.9 24.9  21.0 21.2 21.2
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   7.3  8.5  8.5   5.3  7.8  7.8  24.9 24.9 24.9  21.0 21.2 21.2
DesignQueue:    1   22    0     0   19    0     3    0    3     2    1    2
********************************************************************************
```



```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #20 University Avenue / Sixth Street
********************************************************************************
Cycle (sec):        128              Critical Vol./Cap. (X):        1.041
Loss Time (sec):     16 (Y+R =  5 sec) Average Delay (sec/veh):      106.1
Optimal Cycle:      180              Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     6   23   23     0   23   23     6   15   15     6   15   15
Lanes:        1  0  1  0  1   1  0  1  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     343  353   48   101  239  465   163  827  212    42 1205   33
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  343  353   48   101  239  465   163  827  212    42 1205   33
Added Vol:      0    4    2     0   19    8     1   35    0     5  247    0
Future:        10   70   40   100  130  100    20  200   20    20  120   10
Initial Fut:  353  427   90   201  388  573   184 1062  232    67 1572   43
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   353  427   90   201  388  573   184 1062  232    67 1572   43
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  353  427   90   201  388  573   184 1062  232    67 1572   43
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   353  427   90   201  388  573   184 1062  232    67 1572   43
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.98 1.00 0.85  1.00 1.00 0.85  0.95 0.92 0.92  0.95 0.95 0.95
Lanes:       1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.64 0.36  1.00 1.95 0.05
Final Sat.:  1855 1900 1615  1900 1900 1615  1805 2883  630  1805 3500   96
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.22 0.06  0.11 0.20 0.35  0.10 0.37 0.37  0.04 0.45 0.45
Crit Moves:  ****                       ****  ****                  ****
Green/Cycle: 0.33 0.33 0.33  0.28 0.28 0.28  0.08 0.39 0.39  0.05 0.36 0.36
Volume/Cap:  0.58 0.68 0.17  0.38 0.72 1.26  1.26 0.94 0.94  0.79 1.26 1.26
Delay/Veh:   57.3 42.9 31.1  38.9 49.8 179.2 218.9 51.5 51.5 112.4  164 164.1
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  57.3 42.9 31.1  38.9 49.8 179.2 218.9 51.5 51.5 112.4  164 164.1
DesignQueue:   22   22    4    11   21   32    12   51   11     5   81    2
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #21 University Avenue / San Pablo Avenue

Cycle (sec): 128 Critical Vol./Cap. (X): 1.095
Loss Time (sec): 16 (Y+R = 4 sec) Average Delay (sec/veh): 196.1
Optimal Cycle: 180 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	5	21	21	5	21	21	5	22	22	5	22	22
Lanes:	1 0 1 1 0			1 0 1 1 0			1 0 1 1 0			1 0 1 1 0		
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM												
Base Vol:	233	945	93	141	681	84	87	986	105	71	906	125
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	233	945	93	141	681	84	87	986	105	71	906	125
Added Vol:	1	19	1	8	8	0	0	36	0	6	251	68
Future:	50	90	10	20	220	60	90	190	80	10	60	20
Initial Fut:	284	1054	104	169	909	144	177	1212	185	87	1217	213
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	284	1054	104	169	909	144	177	1212	185	87	1217	213
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	284	1054	104	169	909	144	177	1212	185	87	1217	213
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	284	1054	104	169	909	144	177	1212	185	87	1217	213
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.93	0.93	0.95	0.93	0.93	0.95	0.93	0.93
Lanes:	1.00	1.82	0.18	1.00	1.73	0.27	1.00	1.74	0.26	1.00	1.70	0.30
Final Sat.:	1805	3243	320	1805	3051	483	1805	3069	468	1805	3005	526
Capacity Analysis Module:												
Vol/Sat:	0.16	0.33	0.33	0.09	0.30	0.30	0.10	0.39	0.39	0.05	0.41	0.41
Crit Moves:	****				****		****				****	
Green/Cycle:	0.14	0.28	0.28	0.09	0.28	0.28	0.09	0.21	0.21	0.05	0.36	0.36
Volume/Cap:	1.11	1.16	1.16	0.99	1.06	1.06	1.11	1.88	1.88	0.98	1.11	1.11
Delay/Veh:	143.9	130	129.7	125.0	93.3	93.3	162.1	452	451.8	150.2	102	101.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	143.9	130	129.7	125.0	93.3	93.3	162.1	452	451.8	150.2	102	101.6
DesignQueue:	18	59	6	11	50	8	12	75	12	6	61	11

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #22 University Avenue / Martin Luther King Way

Cycle (sec): 85 Critical Vol./Cap. (X): 0.986
Loss Time (sec): 12 (Y+R = 5 sec) Average Delay (sec/veh): 38.7
Optimal Cycle: 180 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	5	23	23	23	23	23	17	17	17	17	17	17
Lanes:	1 0 1 1 0			1 0 1 1 0			1 0 1 1 0			1 0 1 1 0		
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	282	902	78	46	702	77	80	679	134	71	727	81
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	282	902	78	46	702	77	80	679	134	71	727	81
Added Vol:	12	25	0	0	3	1	0	45	0	3	311	0
Future:	30	200	20	30	60	10	30	170	40	10	70	10
Initial Fut:	324	1127	98	76	765	88	110	894	174	84	1108	91
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	324	1127	98	76	765	88	110	894	174	84	1108	91
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	324	1127	98	76	765	88	110	894	174	84	1108	91
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	324	1127	98	76	765	88	110	894	174	84	1108	91
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.37	0.94	0.94	0.13	0.94	0.94	0.14	0.93	0.93	0.14	0.94	0.94
Lanes:	1.00	1.84	0.16	1.00	1.79	0.21	1.00	1.67	0.33	1.00	1.85	0.15
Final Sat.:	709	3281	285	251	3189	367	268	2949	574	268	3299	271
Capacity Analysis Module:												
Vol/Sat:	0.46	0.34	0.34	0.30	0.24	0.24	0.41	0.30	0.30	0.31	0.34	0.34
Crit Moves:	****			****			****					
Green/Cycle:	0.52	0.52	0.52	0.39	0.39	0.39	0.33	0.33	0.33	0.33	0.33	0.33
Volume/Cap:	0.88	0.66	0.66	0.78	0.62	0.62	1.23	0.91	0.91	0.94	1.01	1.01
Delay/Veh:	37.8	12.8	12.8	66.6	21.2	21.2	198.4	39.0	39.0	107.5	56.3	56.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.8	12.8	12.8	66.6	21.2	21.2	198.4	39.0	39.0	107.5	56.3	56.3
DesignQueue:	14	28	2	2	24	3	4	30	6	3	38	3

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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #23 University Avenue / Milvia Street
*******************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.635
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        22.3
Optimal Cycle:       49               Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    21   21    21    21   21    21    20   20    20    20   20    20
Lanes:        1  0  0  1  0    0  0  1! 0  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     127  218    44    13  102    74    47  649   108    22  651    33
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  127  218    44    13  102    74    47  649   108    22  651    33
Added Vol:      0    0     0     0    0     0     0   46     0     0  314     0
Future:        10   10    10    10   10    10    20  180    20    10   80    20
Initial Fut:  137  228    54    23  112    84    67  875   128    32 1045    53
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   137  228    54    23  112    84    67  875   128    32 1045    53
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  137  228    54    23  112    84    67  875   128    32 1045    53
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   137  228    54    23  112    84    67  875   128    32 1045    53
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.70 0.97  0.97  0.90 0.90  0.90  0.68 0.68  0.68  0.85 0.85  0.85
Lanes:       1.00 0.81  0.19  0.11 0.51  0.38  0.12 1.64  0.24  0.06 1.85  0.09
Final Sat.:  1336 1492   353   180  875   656   162 2110   309    91 2984   151
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.15  0.15  0.13 0.13  0.13  0.41 0.41  0.41  0.35 0.35  0.35
Crit Moves:       ****                              ****
Green/Cycle: 0.35 0.35  0.35  0.35 0.35  0.35  0.47 0.47  0.47  0.47 0.47  0.47
Volume/Cap:  0.30 0.44  0.44  0.37 0.37  0.37  0.88 0.88  0.88  0.74 0.74  0.74
Delay/Veh:   19.5 21.1  21.1  20.1 20.1  20.1  26.7 26.7  26.7  19.3 19.3  19.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  19.5 21.1  21.1  20.1 20.1  20.1  26.7 26.7  26.7  19.3 19.3  19.3
DesignQueue:    4    6     2     1    3     2     2   21     3     1   25     1
*******************************************************************************
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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #24 University Avenue / SB Shattuck Avenue
*******************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.889
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        21.5
Optimal Cycle:       83               Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    16   16    16    16   16    16    16   16    16
Lanes:        0  0  0  0  0    0  1  1  1  0    1  0  1  1  0    0  1  0  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0    55  576   146   131  374   254    74  642   640
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    55  576   146   131  374   254    74  642   640
Added Vol:      0    0     0     0   41    50     7   23    16     2  265     5
Future:         0    0     0    33  253    33    44  110    55    11   88   143
Initial Fut:    0    0     0    88  870   229   182  507   325    87  995   788
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    88  870   229   182  507   325    87  995   788
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0    88  870   229   182  507   325    87  995   788
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    0     0    88  870   229   182  507   325    87  995   788
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.77 0.77  0.77  0.18 0.80  0.80  0.68 0.68  0.68
Lanes:       0.00 0.00  0.00  0.22 2.20  0.58  1.00 1.22  0.78  0.14 1.60  1.26
Final Sat.:     0    0     0   326 3226   849   347 1863  1194   179 2048  1622
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.27 0.27  0.27  0.52 0.27  0.27  0.49 0.49  0.49
Crit Moves:                        ****        ****
Green/Cycle: 0.00 0.00  0.00  0.30 0.30  0.30  0.59 0.59  0.59  0.59 0.59  0.59
Volume/Cap:  0.00 0.00  0.00  0.89 0.89  0.89  0.89 0.46  0.46  0.82 0.82  0.82
Delay/Veh:    0.0  0.0   0.0  34.0 34.0  34.0  52.6  9.5   9.5  15.8 15.8  15.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  34.0 34.0  34.0  52.6  9.5   9.5  15.8 15.8  15.8
DesignQueue:    0    0     0     3   27     7     3    9     6     2   19    15
*******************************************************************************
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------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #25 University Avenue / NB Shattuck Avenue
******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.601
Loss Time (sec):     15 (Y+R =  4 sec) Average Delay (sec/veh):      18.2
Optimal Cycle:       52              Level Of Service:                 B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    19    0    19    0    0     0    0   13     0    0   13     0
Lanes:        2  0  1! 0  1   0  0  0  0  0   0  0  2  0  0   0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     938    0   208    0    0     0    0  454     0    0  433     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  938    0   208    0    0     0    0  454     0    0  433     0
Added Vol:    155    0    11    0    0     0    0   23     0    0  117     0
Future:       150    0    40    0    0     0    0    0     0    0   70     0
Initial Fut: 1243    0   259    0    0     0    0  477     0    0  620     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  1243    0   259    0    0     0    0  477     0    0  620     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 1243    0   259    0    0     0    0  477     0    0  620     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  1243    0   259    0    0     0    0  477     0    0  620     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.82 1.00  0.84 1.00 1.00  1.00 1.00 0.86  1.00 1.00 0.86  1.00
Lanes:       2.77 0.00  1.23 0.00 0.00  0.00 0.00 2.00  0.00 0.00 2.00  0.00
Final Sat.:  4292    0  1971    0    0     0    0 3249     0    0 3249     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.29 0.00  0.13 0.00 0.00  0.00 0.00 0.15  0.00 0.00 0.19  0.00
Crit Moves:  ****                            ****                   ****
Green/Cycle: 0.48 0.00  0.48 0.00 0.00  0.00 0.00 0.32  0.00 0.00 0.32  0.00
Volume/Cap:  0.60 0.00  0.27 0.00 0.00  0.00 0.00 0.46  0.00 0.00 0.60  0.00
Delay/Veh:   15.2  0.0  11.7  0.0  0.0   0.0  0.0 21.9   0.0  0.0 24.2   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  15.2  0.0  11.7  0.0  0.0   0.0  0.0 21.9   0.0  0.0 24.2   0.0
DesignQueue:   29    0     6    0    0     0    0   14     0    0   18     0
******************************************************************************
```



```
------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #26 University Avenue / Oxford Street
******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.871
Loss Time (sec):      4 (Y+R =  4 sec) Average Delay (sec/veh):      29.0
Optimal Cycle:      122              Level Of Service:                 C
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18   18   18    18   18   18    18   18   18    18
Lanes:        1  0  1  1  0   1  0  1  1  0   1  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     278  771    16   32  835   106  306   39   330    9   37    40
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  278  771    16   32  835   106  306   39   330    9   37    40
Added Vol:     90   75     0    0   55    33   16   -1    19   -2   -6    -2
Future:        55  143     0   11  176    33   22   11    22    0   11    11
Initial Fut:  423  989    16   43 1066   172  344   49   371    7   42    49
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   423  989    16   43 1066   172  344   49   371    7   42    49
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  423  989    16   43 1066   172  344   49   371    7   42    49
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   423  989    16   43 1066   172  344   49   371    7   42    49
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.41 0.85  0.85 0.24 0.84  0.84 0.59 0.59  0.77 0.83 0.83  0.83
Lanes:       1.00 1.97  0.03 1.00 1.72  0.28 1.75 0.25  1.00 0.07 0.43  0.50
Final Sat.:   785 3191    52  450 2739   442 1970  281  1454  112  675   787
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.54 0.31  0.31 0.10 0.39  0.39 0.17 0.17  0.26 0.06 0.06  0.06
Crit Moves:  ****                 ****                  ****
Green/Cycle: 0.68 0.68  0.68 0.41 0.41  0.41 0.27 0.27  0.27 0.27 0.27  0.27
Volume/Cap:  0.79 0.46  0.46 0.23 0.96  0.96 0.65 0.65  0.96 0.23 0.23  0.23
Delay/Veh:   28.9  6.3   6.3 17.6 38.0  38.0 29.9 29.9  62.9 22.8 22.8  22.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  28.9  6.3   6.3 17.6 38.0  38.0 29.9 29.9  62.9 22.8 22.8  22.8
DesignQueue:   14   14     0    1   29     5   11    2    12    0    1     2
******************************************************************************
```

```
--------------------------------------------------------------------------------
                               365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                   PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #27 Univeristy Drive (East Gate)  / Gayley Road
********************************************************************************
Average Delay (sec/veh):      2.1           Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      59  552     0     0  505    52    41    0    81     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   59  552     0     0  505    52    41    0    81     0    0     0
Added Vol:     -2   49     0     0   34    -3   -19    0   -12     0    0     0
Future:        20  110     0     0   60    10    10    0    20     0    0     0
Initial Fut:   77  711     0     0  599    59    32    0    89     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    77  711     0     0  599    59    32    0    89     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    77  711     0     0  599    59    32    0    89     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  658 xxxx xxxxx  xxxx xxxx xxxxx  1494 xxxx   629  xxxx xxxx xxxxx
Potent Cap.:  939 xxxx xxxxx  xxxx xxxx xxxxx   137 xxxx   486  xxxx xxxx xxxxx
Move Cap.:    939 xxxx xxxxx  xxxx xxxx xxxxx   128 xxxx   486  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.2 xxxx xxxxx xxxxx xxxx xxxxx  42.1 xxxx  14.1 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     E    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            21.5            xxxxxx
ApproachLOS:        *                *                C                *
```



```
--------------------------------------------------------------------------------
                               365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                   PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #28 Addison Street / Oxford Street
********************************************************************************
Average Delay (sec/veh):      1.5           Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  2  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      32 1006     0     0  952    28    10    0   114     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   32 1006     0     0  952    28    10    0   114     0    0     0
Added Vol:      3  149     0     0   70     2    16    0    18     0    0     0
Future:        10  180     0     0  170    10     0    0    10     0    0     0
Initial Fut:   45 1335     0     0 1192    40    26    0   142     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    48 1420     0     0 1268    43    28    0   151     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    48 1420     0     0 1268    43    28    0   151     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  830 xxxx xxxxx  xxxx xxxx xxxxx  1635 xxxx     0  xxxx xxxx xxxxx
Potent Cap.:  607 xxxx xxxxx  xxxx xxxx xxxxx    65 xxxx     0  xxxx xxxx xxxxx
Move Cap.:    607 xxxx xxxxx  xxxx xxxx xxxxx    61 xxxx     0  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 11.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  397 xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 21.3 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    C     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            21.3            xxxxxx
ApproachLOS:        *                *                C                *
```

```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #29 Center Street / SB Shattuck Avenue
********************************************************************************
Cycle (sec):        75               Critical Vol./Cap. (X):        0.621
Loss Time (sec):    12 (Y+R = 10 sec) Average Delay (sec/veh):       17.2
Optimal Cycle:      67               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0   30    30    30    0    17    17   25    25     0
Lanes:       0  0  0  0  0    0  1  1  1  0    0  0  0  1  0    0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0     0    41  790   126     0  104   179    29  160     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0     0    41  790   126     0  104   179    29  160     0
Added Vol:     0    0     0     0   71     0     0    0     0    -2    2     0
Future:        0    0     0    10  230    40     0   50    30    30   40     0
Initial Fut:   0    0     0    51 1091   166     0  154   209    57  202     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0     0    51 1091   166     0  154   209    57  202     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0    0     0    51 1091   166     0  154   209    57  202     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0    0     0    51 1091   166     0  154   209    57  202     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.79 0.79  0.79  1.00 0.83  0.83  0.79 0.79  1.00
Lanes:       0.00 0.00  0.00  0.12 2.50  0.38  0.00 0.42  0.58  0.22 0.78  0.00
Final Sat.:    0    0     0   175 3747   570     0  669   908   329 1164     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.29 0.29  0.29  0.00 0.23  0.23  0.17 0.17  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.00 0.00  0.00  0.40 0.40  0.40  0.00 0.29  0.29  0.43 0.43  0.00
Volume/Cap:  0.00 0.00  0.00  0.73 0.73  0.73  0.00 0.78  0.78  0.41 0.41  0.00
Delay/Veh:    0.0  0.0   0.0  13.2 13.2  13.2   0.0 36.9  36.9   9.4  9.4   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  13.2 13.2  13.2   0.0 36.9  36.9   9.4  9.4   0.0
DesignQueue:   0    0     0     1   29     4     0    5     6     1    5     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #30 Center Street / NB Shattuck Avenue
********************************************************************************
Cycle (sec):        75               Critical Vol./Cap. (X):        0.550
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):        9.5
Optimal Cycle:      65               Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   40    40    40    0     0     0   17    17     0    0    17    17
Lanes:       0  1  1  1  0    0  0  0  0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     50  982    86     0    0     0    81   55     0     0  139    58
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  50  982    86     0    0     0    81   55     0     0  139    58
Added Vol:     0  116     0     0    0     0     0    0     0     0    0     0
Future:       30  110    30     0    0     0    30   40     0     0   40    60
Initial Fut:  80 1208   116     0    0     0   111   95     0     0  179   118
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   80 1208   116     0    0     0   111   95     0     0  179   118
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  80 1208   116     0    0     0   111   95     0     0  179   118
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   80 1208   116     0    0     0   111   95     0     0  179   118
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.80 0.80  0.80  1.00 1.00  1.00  0.74 0.74  1.00  1.00 0.85  0.85
Lanes:       0.17 2.58  0.25  0.00 0.00  0.00  0.54 0.46  0.00  0.00 0.60  0.40
Final Sat.:   260 3921   376     0    0     0   754  645     0     0  975   643
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.31 0.31  0.31  0.00 0.00  0.00  0.15 0.15  0.00  0.00 0.18  0.18
Crit Moves:       ****                                                 ****
Green/Cycle: 0.53 0.53  0.53  0.00 0.00  0.00  0.29 0.29  0.00  0.00 0.29  0.29
Volume/Cap:  0.58 0.58  0.58  0.00 0.00  0.00  0.50 0.50  0.00  0.00 0.63  0.63
Delay/Veh:    3.8  3.8   3.8   0.0  0.0   0.0  20.2 20.2   0.0   0.0 29.1  29.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   3.8  3.8   3.8   0.0  0.0   0.0  20.2 20.2   0.0   0.0 29.1  29.1
DesignQueue:   2   25     2     0    0     0     3    3     0     0    5     4
********************************************************************************
```

```
-----------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                             PM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #31 Center Street / Oxford Street
*****************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.550
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       10.5
Optimal Cycle:       46              Level Of Service:                 B
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   19   19    19   19   19    19   19   19    19   19   19    19
Lanes:       1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2000 << 4:00 - 6:00 PM
Base Vol:     87  998    24   19  980    67   33    6    84   37    9    16
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  87  998    24   19  980    67   33    6    84   37    9    16
Added Vol:     0  156     0   -1   85     3    0    0     0   -2   -3    -5
Future:       40  150    10    0  150    30   30    0    30    0    0     0
Initial Fut: 127 1304    34   18 1215   100   63    6   114   35    6    11
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  127 1304    34   18 1215   100   63    6   114   35    6    11
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 127 1304    34   18 1215   100   63    6   114   35    6    11
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  127 1304    34   18 1215   100   63    6   114   35    6    11
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.19 0.95  0.95 0.18 0.94  0.94 0.81 0.81  0.81 0.76 0.76  0.76
Lanes:       1.00 1.95  0.05 1.00 1.85  0.15 0.34 0.03  0.63 0.67 0.12  0.21
Final Sat.:   359 3504    91  348 3299   272  527   50   954  977  168   307
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.35 0.37  0.37 0.05 0.37  0.37 0.12 0.12  0.12 0.04 0.04  0.04
Crit Moves:       ****                           ****
Green/Cycle: 0.64 0.64  0.64 0.64 0.64  0.64 0.25 0.25  0.25 0.25 0.25  0.25
Volume/Cap:  0.55 0.58  0.58 0.08 0.58  0.58 0.47 0.47  0.47 0.14 0.14  0.14
Delay/Veh:   16.8  8.8   8.8  5.8  8.8   8.8 27.8 27.8  27.8 22.5 22.5  22.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  16.8  8.8   8.8  5.8  8.8   8.8 27.8 27.8  27.8 22.5 22.5  22.5
DesignQueue:    2   22     1    0   20     2    2    0     4    1    0     0
*****************************************************************************
```



```
-----------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                             PM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
*****************************************************************************
Intersection #32 Stadium Rim Road / Gayley Road
*****************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        1.187
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       73.5
Optimal Cycle:        0              Level Of Service:                 F
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  0  1  0   0  1  0  0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  359    19  135  459     0   20    7    15   47    0   232
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  359    19  135  459     0   20    7    15   47    0   232
Added Vol:     0   47    20    4   18     0    0    0     0    3    0     1
Future:        0   99    11   22   55     0    0    0     0   11    0    33
Initial Fut:   0  505    50  161  532     0   20    7    15   61    0   266
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  505    50  161  532     0   20    7    15   61    0   266
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  505    50  161  532     0   20    7    15   61    0   266
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  505    50  161  532     0   20    7    15   61    0   266
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.91  0.09 0.23 0.77  0.00 0.47 0.17  0.36 0.19 0.00  0.81
Final Sat.:     0  533    53  136  448     0  201   70   151  101    0   441
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.95  0.95 1.19 1.19  xxxx 0.10 0.10  0.10 0.60 xxxx  0.60
Crit Moves:       ****       ****             ****             ****
Delay/Veh:    0.0 49.2  49.2 122.5  123   0.0 11.8 11.8  11.8 18.7  0.0  18.7
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 49.2  49.2 122.5  123   0.0 11.8 11.8  11.8 18.7  0.0  18.7
LOS by Move:    *    E     E    F    F     *    B    B     B    C    *     C
ApproachDel:      49.2            122.5             11.8             18.7
Delay Adj:        1.00             1.00             1.00             1.00
ApprAdjDel:       49.2            122.5             11.8             18.7
LOS by Appr:        E                F                B                C
*****************************************************************************
```

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #33 Allston Way / Oxford Street
********************************************************************************
Average Delay (sec/veh):      2.8          Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  1  0  0   0  1  0  1  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      46 1002     0    26 1082    75    23    0   110     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   46 1002     0    26 1082    75    23    0   110     0    0     0
Added Vol:      0  156     0     0   83     0     0    0     0     0    0     0
Future:         0  190     0    10  160    10     0    0    30     0    0     0
Initial Fut:   46 1348     0    36 1325    85    23    0   140     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    46 1348     0    36 1325    85    23    0   140     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    46 1348     0    36 1325    85    23    0   140     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1296 xxxx xxxxx  1348 xxxx xxxxx  2147 xxxx   549  xxxx xxxx xxxxx
Potent Cap.:  511 xxxx xxxxx   517 xxxx xxxxx    40 xxxx   457  xxxx xxxx xxxxx
Move Cap.:    511 xxxx xxxxx   517 xxxx xxxxx    35 xxxx   457  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 12.7 xxxx xxxxx  12.5 xxxx xxxxx 219.9 xxxx  16.3 xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     F    *     C     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 12.7 xxxx xxxxx  12.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             45.0            xxxxxx
ApproachLOS:        *                *                 E                *
```



```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #34 Kittridge Street / Oxford Street / Fulton Street
********************************************************************************
Average Delay (sec/veh): OVERFLOW          Worst Case Level Of Service:       F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  1  0   0  1  0  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      45  995     0     0 1108    96    51    0    69     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   45  995     0     0 1108    96    51    0    69     0    0     0
Added Vol:      0   94     3     9   74     0     0    3     0    18   26    62
Future:        20  180     0     0  150    30    10    0    20     0    0     0
Initial Fut:   65 1269     3     9 1332   126    61    3    89    18   26    62
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    65 1269     3     9 1332   126    61    3    89    18   26    62
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    65 1269     3     9 1332   126    61    3    89    18   26    62
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.5  6.5   6.9   7.5  6.5   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1357 xxxx xxxxx  1272 xxxx xxxxx  2136 2795   588  2026 2860   636
Potent Cap.:  487 xxxx xxxxx   553 xxxx xxxxx    27   18   434    33   16   425
Move Cap.:    487 xxxx xxxxx   553 xxxx xxxxx     0   15   434    20   14   425
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 13.5 xxxx xxxxx  11.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     *    *     *     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx   36 xxxxx
Shrd StpDel: 13.5 xxxx xxxxx  11.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx 1122 xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           1122.1
ApproachLOS:        *                *                F                F
```

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-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
*****************************************************************************
Intersection #35 Stadium Rim Road / Centennial Drive
*****************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.552
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       11.9
Optimal Cycle:        0              Level Of Service:                 B
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  0  1  0    0  1  0  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0   99   140   102   57     0    0    0     0   204    0   146
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0   99   140   102   57     0    0    0     0   204    0   146
Added Vol:     0    0     0    25    0     0    0    0     0     0    0     4
Future:        0   22    22    22   11     0    0    0     0    11    0    22
Initial Fut:   0  121   162   149   68     0    0    0     0   215    0   172
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  121   162   149   68     0    0    0     0   215    0   172
Reduct Vol:    0    0     0     0    0     0    0    0     0     0    0     0
Reduced Vol:   0  121   162   149   68     0    0    0     0   215    0   172
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0  121   162   149   68     0    0    0     0   215    0   172
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 0.43  0.57  0.69 0.31  0.00  0.00 0.00  0.00  0.56 0.00  0.44
Final Sat.:    0  302   404   435  199     0    0    0     0   390    0   312
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.40  0.40  0.34 0.34  xxxx  xxxx xxxx  xxxx  0.55 xxxx  0.55
Crit Moves:             ****       ****                                    ****
Delay/Veh:    0.0 10.8  10.8  10.9 10.9   0.0   0.0  0.0   0.0  13.3  0.0  13.3
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 10.8  10.8  10.9 10.9   0.0   0.0  0.0   0.0  13.3  0.0  13.3
LOS by Move:   *    B     B     B    B     *     *    *     *     B    *     B
ApproachDel:      10.8             10.9            xxxxxx            13.3
Delay Adj:        1.00             1.00             xxxxx            1.00
ApprAdjDel:       10.8             10.9            xxxxxx            13.3
LOS by Appr:        B                B                *                B
*****************************************************************************
```



```
-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #36 Bancroft Way / Shattuck Avenue
*****************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.824
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       21.8
Optimal Cycle:       65              Level Of Service:                 C
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18     0    0   18    18    0    0     0    16   16    16
Lanes:       1  0  2  0  0    0  0  1  1  0    0  0  1! 0  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     30 1186     0     0  949    23    1    0    38   258   97   111
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  30 1186     0     0  949    23    1    0    38   258   97   111
Added Vol:     0   43     0     0   95     0    0    0     0   104    0    76
Future:       10  150     0     0  290    10    0    0     0    30   20    20
Initial Fut:  40 1379     0     0 1334    33    1    0    38   392  117   207
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   40 1379     0     0 1334    33    1    0    38   392  117   207
Reduct Vol:    0    0     0     0    0     0    0    0     0     0    0     0
Reduced Vol:  40 1379     0     0 1334    33    1    0    38   392  117   207
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   40 1379     0     0 1334    33    1    0    38   392  117   207
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.14 0.86  1.00  1.00 0.85  0.85  0.78 1.00  0.78  0.66 0.81  0.81
Lanes:       1.00 2.00  0.00  0.00 1.95  0.05  0.03 0.00  0.97  1.00 0.36  0.64
Final Sat.:   263 3249     0     0 3158    78    38    0  1438  1259  558   988
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.42  0.00  0.00 0.42  0.42  0.03 0.00  0.03  0.31 0.21  0.21
Crit Moves:       ****                                          ****
Green/Cycle: 0.52 0.52  0.00  0.00 0.52  0.52  0.38 0.00  0.38  0.38 0.38  0.38
Volume/Cap:  0.29 0.82  0.00  0.00 0.82  0.82  0.07 0.00  0.07  0.82 0.55  0.55
Delay/Veh:   15.8 20.1   0.0   0.0 19.9  19.9  15.1  0.0  15.1  36.0 22.1  22.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  15.8 20.1   0.0   0.0 19.9  19.9  15.1  0.0  15.1  36.0 22.1  22.1
DesignQueue:    1   31     0     0   30     1     0    0     1    11    3     6
*****************************************************************************
```

```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #37 Bancroft Way / Fulton Street
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.506
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       10.2
Optimal Cycle:       49               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Ignore
Min. Green:   17   17     0    0   17    17    0    0     0   24   24    24
Lanes:       0  1  1  0  0   0  0  2  1  0   0  0  0  0  0   0  1  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     18  164     0    0 1066   165    0    0     0   12  287   898
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  18  164     0    0 1066   165    0    0     0   12  287   898
Added Vol:     2    0     0    0   85     7    0    0     0   20  139    97
Future:       10   10     0    0  130    20    0    0     0   10   30   170
Initial Fut:  30  174     0    0 1281   192    0    0     0   42  456  1165
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
PHF Volume:   30  174     0    0 1281   192    0    0     0   42  456     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  30  174     0    0 1281   192    0    0     0   42  456     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  0.00
Final Vol.:   30  174     0    0 1281   192    0    0     0   42  456     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.73 0.73  1.00 1.00 0.89  0.89 1.00 1.00  1.00 0.81 0.81  1.00
Lanes:       0.29 1.71  0.00 0.00 2.61  0.39 0.00 0.00  0.00 0.17 1.83  1.00
Final Sat.:   408 2365     0    0 4425   663    0    0     0  259 2810  1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.07  0.00 0.00 0.29  0.29 0.00 0.00  0.00 0.16 0.16  0.00
Crit Moves:                       ****                              ****
Green/Cycle: 0.57 0.57  0.00 0.00 0.57  0.57 0.00 0.00  0.00 0.32 0.32  0.00
Volume/Cap:  0.13 0.13  0.00 0.00 0.51  0.51 0.00 0.00  0.00 0.51 0.51  0.00
Delay/Veh:    4.9  4.9   0.0  0.0  6.8   6.8  0.0  0.0   0.0 22.5 22.5   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   4.9  4.9   0.0  0.0  6.8   6.8  0.0  0.0   0.0 22.5 22.5   0.0
DesignQueue:    1    3     0    0   24     4    0    0     0    1   13     0
********************************************************************************
```



```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #38 Bancroft Way / Ellsworth Street
********************************************************************************
Average Delay (sec/veh):      9.9        Worst Case Level Of Service:        E
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       1  1  0  0  0   0  0  0  0  1   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:    348   11     0    0    0   100    0    0     0    0  877     6
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 348   11     0    0    0   100    0    0     0    0  877     6
Added Vol:    12    0     0    0    0     0    0    0     0    0  153     0
Future:       50    0     0    0    0     0    0    0     0    0  230     0
Initial Fut: 410   11     0    0    0   100    0    0     0    0 1260     6
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  410   11     0    0    0   100    0    0     0    0 1260     6
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Final Vol.:  410   11     0    0    0   100    0    0     0    0 1260     6
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 630 1266 xxxxx  xxxx xxxx   633  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: 397  171 xxxxx  xxxx xxxx   483  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   315  171 xxxxx  xxxx xxxx   483  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 35.5 xxxx xxxxx xxxxx xxxx  14.4 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   E    *     *     *    *     B     *    *     *     *    *     *
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: 302 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 42.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    E    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:      38.8             14.4            xxxxxx            xxxxxx
ApproachLOS:        E                B                *                 *
```

```
-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
          Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
         2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #39 Bancroft Way / Dana Street
*******************************************************************************
Average Delay (sec/veh):      0.0          Worst Case Level Of Service:       A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  1  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0     0    0     0     0    0     0   282  873     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0    0     0     0    0     0   282  873     0
Added Vol:      0    0     0     0    0     0     0    0     0    32  153     0
Future:         0    0     0     0    0     0     0    0     0    50  230     0
Initial Fut:    0    0     0     0    0     0     0    0     0   364 1256     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0     0    0     0     0    0     0   364 1256     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0     0    0     0     0    0     0   364 1256     0
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        *                *                *                *
```



```
-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
          Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #40 Bancroft Way / Telegraph Avenue
*******************************************************************************
Cycle (sec):          70              Critical Vol./Cap. (X):        0.413
Loss Time (sec):       8 (Y+R = 22 sec) Average Delay (sec/veh):       19.3
Optimal Cycle:        58              Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    29    0     0     0    0     0     0    0     0     0   21     0
Lanes:        2  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     495    0     0     0    0     0     0    0     0     0  675     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  495    0     0     0    0     0     0    0     0     0  675     0
Added Vol:      3    0     0     0    0     0     0    0     0     0  152     0
Future:       130    0     0     0    0     0     0    0     0     0  140     0
Initial Fut:  628    0     0     0    0     0     0    0     0     0  967     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   628    0     0     0    0     0     0    0     0     0  967     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  628    0     0     0    0     0     0    0     0     0  967     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   628    0     0     0    0     0     0    0     0     0  967     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.91  1.00
Lanes:       2.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 3.00  0.00
Final Sat.:  3502    0     0     0    0     0     0    0     0     0 5187     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.19  0.00
Crit Moves:  ****                                                    ****
Green/Cycle: 0.42 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.30  0.00
Volume/Cap:  0.43 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.62  0.00
Delay/Veh:   13.6  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 23.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  13.6  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 23.0   0.0
DesignQueue:   15    0     0     0    0     0     0    0     0     0   28     0
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #41 Bancroft Way / Bowditch Street
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.666
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       16.1
Optimal Cycle:        0               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     191    0    0    0    0    0    0    0    0   99  494    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  191    0    0    0    0    0    0    0    0   99  494    0
Added Vol:      0    0    0    0    0    0    0    0    0   27  152    0
Future:        30    0    0    0    0    0    0    0    0   20  110    0
Initial Fut:  221    0    0    0    0    0    0    0    0  146  756    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   221    0    0    0    0    0    0    0    0  146  756    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  221    0    0    0    0    0    0    0    0  146  756    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   221    0    0    0    0    0    0    0    0  146  756    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.32 1.68 0.00
Final Sat.:   617    0    0    0    0    0    0    0    0  219 1156    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.36 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.67 0.65 xxxx
Crit Moves:  ****                                        ****
Delay/Veh:   11.7  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 17.7 17.0  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  11.7  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 17.7 17.0  0.0
LOS by Move:    B    *    *    *    *    *    *    *    *    C    C    *
ApproachDel:       11.7           xxxxxx           xxxxxx           17.1
Delay Adj:         1.00            xxxxx            xxxxx           1.00
ApprAdjDel:        11.7           xxxxxx           xxxxxx           17.1
LOS by Appr:         B                *                *               C
********************************************************************************
```



```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #42 Bancroft Way / College Avenue
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.709
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       15.6
Optimal Cycle:        0               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     371    0    0    0    0    0    0    0    0   83  226    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  371    0    0    0    0    0    0    0    0   83  226    0
Added Vol:     20    0    0    0    0    0    0    0    0    3   37    0
Future:       110    0    0    0    0    0    0    0    0    0   22    0
Initial Fut:  501    0    0    0    0    0    0    0    0   86  285    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   501    0    0    0    0    0    0    0    0   86  285    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  501    0    0    0    0    0    0    0    0   86  285    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   501    0    0    0    0    0    0    0    0   86  285    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.46 1.54 0.00
Final Sat.:   706    0    0    0    0    0    0    0    0  269  914    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.71 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.32 0.31 xxxx
Crit Moves:  ****                                        ****
Delay/Veh:   18.8  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 11.3 11.0  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  18.8  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 11.3 11.0  0.0
LOS by Move:    C    *    *    *    *    *    *    *    *    B    B    *
ApproachDel:       18.8           xxxxxx           xxxxxx           11.1
Delay Adj:         1.00            xxxxx            xxxxx           1.00
ApprAdjDel:        18.8           xxxxxx           xxxxxx           11.1
LOS by Appr:         C                *                *               B
********************************************************************************
```

```
------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
******************************************************************************
Intersection #43 Bancroft Way / Piedmont Avenue
******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.977
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):      35.7
Optimal Cycle:        0              Level Of Service:                 E
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     152  439     0     0  357   159     0    0     0     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  152  439     0     0  357   159     0    0     0     0    0     0
Added Vol:     13   57     0     0   26    27     0    0     0     0    0     0
Future:        11   99     0     0   44    11     0    0     0     0    0     0
Initial Fut:  176  595     0     0  427   197     0    0     0     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   176  595     0     0  427   197     0    0     0     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  176  595     0     0  427   197     0    0     0     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   176  595     0     0  427   197     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.23 0.77  0.00  0.00 0.68  0.32  0.00 0.00  0.00  0.00 0.00  0.00
Final Sat.:   180  609     0     0  548   253     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.98 0.98  xxxx  xxxx 0.78  0.78  xxxx xxxx  xxxx  xxxx xxxx  xxxx
Crit Moves:  ****                  ****
Delay/Veh:   47.4 47.4   0.0   0.0 21.2  21.2   0.0  0.0   0.0   0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  47.4 47.4   0.0   0.0 21.2  21.2   0.0  0.0   0.0   0.0  0.0   0.0
LOS by Move:    E    E     *     *    C     C     *    *     *     *    *     *
ApproachDel:      47.4             21.2           xxxxxx           xxxxxx
Delay Adj:        1.00             1.00            xxxxx            xxxxx
ApprAdjDel:       47.4             21.2           xxxxxx           xxxxxx
LOS by Appr:        E                C                *                *
******************************************************************************
```



```
------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #44 Durant Avenue / Shattuck Avenue
******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.816
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):      23.4
Optimal Cycle:       72              Level Of Service:                 C
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted      Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    19   19   19    19   19   19     0    0    0     0    0    0
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      69 1216   120    88 1099    51     9   72    55     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   69 1216   120    88 1099    51     9   72    55     0    0     0
Added Vol:      0   43    13    15  183     0     0    0     0     0    0     0
Future:        11  187    66    66  286    11     0   44    11     0    0     0
Initial Fut:   80 1446   199   169 1568    62     9  116    66     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    80 1446   199   169 1568    62     9  116    66     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   80 1446   199   169 1568    62     9  116    66     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    80 1446   199   169 1568    62     9  116    66     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.14 0.84  0.84  0.86 0.85  0.85  0.77 0.77  0.77  1.00 1.00  1.00
Lanes:       1.00 1.76  0.24  1.00 1.92  0.08  0.09 1.22  0.69  0.00 0.00  0.00
Final Sat.:   260 2805   386  1625 3107   123   138 1773  1009     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.31 0.52  0.52  0.10 0.50  0.50  0.07 0.07  0.07  0.00 0.00  0.00
Crit Moves:       ****        ****                   ****
Green/Cycle: 0.49 0.49  0.49  0.64 0.64  0.64  0.20 0.20  0.20  0.00 0.00  0.00
Volume/Cap:  0.63 1.05  1.05  0.16 0.79  0.79  0.33 0.33  0.33  0.00 0.00  0.00
Delay/Veh:   26.3 44.8  44.8   5.8  3.1   3.1  27.2 27.2  27.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.3 44.8  44.8   5.8  3.1   3.1  27.2 27.2  27.2   0.0  0.0   0.0
DesignQueue:    2   35     5     3   27     1     0    4     2     0    0     0
******************************************************************************
```

```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #45 Durant Avenue / Fulton Street
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.454
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):         9.9
Optimal Cycle:       51               Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0   21   21     0   22   22    22    0    0     0
Lanes:       0  0  0  0  0   1  1  1  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0     0  527  760     0  137  219    33    0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0     0  527  760     0  137  219    33    0    0     0
Added Vol:     0    0     0   86   20     0    2   26     0    0    0     0
Future:        0    0     0   70   90     0   20  110    30    0    0     0
Initial Fut:   0    0     0  683  870     0  159  355    63    0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0     0  683  870     0  159  355    63    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0  683  870     0  159  355    63    0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0    0     0  683  870     0  159  355    63    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.95 0.95  1.00  0.98 0.93  0.93  1.00 1.00  1.00
Lanes:       0.00 0.00  0.00  1.32 1.68  0.00  1.00 1.70  0.30  0.00 0.00  0.00
Final Sat.:    0    0     0 2381 3034     0 1856 2995   532    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.29 0.29  0.00  0.09 0.12  0.12  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.00 0.00  0.00  0.60 0.60  0.00  0.29 0.29  0.29  0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.00  0.48 0.48  0.00  0.29 0.40  0.40  0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0   5.3  5.3   0.0  21.8 22.4  22.4   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0   5.3  5.3   0.0  21.8 22.4  22.4   0.0  0.0   0.0
DesignQueue:   0    0     0   12   16     0    5   11     2    0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #46 Durant Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.458
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        13.3
Optimal Cycle:       43               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   18    18    0    0     0   17   17     0    0    0     0
Lanes:       0  0  1  1  0   0  0  0  0  0   0  1  2  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  362   119    0    0     0  202  690     0    0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  362   119    0    0     0  202  690     0    0    0     0
Added Vol:     0    1     3    0    0     0    2   99     0    0    0     0
Future:        0  110    30    0    0     0   20  160     0    0    0     0
Initial Fut:   0  473   152    0    0     0  224  949     0    0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  473   152    0    0     0  224  949     0    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  473   152    0    0     0  224  949     0    0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0  473   152    0    0     0  224  949     0    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.92  0.92  1.00 1.00  1.00  0.91 0.91  1.00  1.00 1.00  1.00
Lanes:       0.00 1.51  0.49  0.00 0.00  0.00  0.57 2.43  0.00  0.00 0.00  0.00
Final Sat.:    0 2634   846    0    0     0  991 4196     0    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.18  0.00 0.00  0.00  0.23 0.23  0.00  0.00 0.00  0.00
Crit Moves:       ****                             ****
Green/Cycle: 0.00 0.39  0.39  0.00 0.00  0.00  0.49 0.49  0.00  0.00 0.00  0.00
Volume/Cap:  0.00 0.46  0.46  0.00 0.00  0.00  0.46 0.46  0.00  0.00 0.00  0.00
Delay/Veh:    0.0 15.3  15.3   0.0  0.0   0.0  12.2 12.2   0.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 15.3  15.3   0.0  0.0   0.0  12.2 12.2   0.0   0.0  0.0   0.0
DesignQueue:   0   12     4    0    0     0    5   20     0    0    0     0
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #47 Durant Avenue / College Avenue

Cycle (sec): 70 Critical Vol./Cap. (X): 0.431
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 13.6
Optimal Cycle: 42 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	0	18	18	0	0	0	16	16	16	0	0	0
Lanes:		0 0 0 1 0			0 1 0 0 0			1 0 1 1 0			0 0 0 0 0	
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	189	62	16	56	0	127	268	202	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	189	62	16	56	0	127	268	202	0	0	0
Added Vol:	0	4	0	0	3	0	16	95	18	0	0	0
Future:	0	44	22	0	0	0	66	77	44	0	0	0
Initial Fut:	0	237	84	16	59	0	209	440	264	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	237	84	16	59	0	209	440	264	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	237	84	16	59	0	209	440	264	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	237	84	16	59	0	209	440	264	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.97	0.97	0.92	0.92	1.00	0.94	0.90	0.90	1.00	1.00	1.00
Lanes:	0.00	0.74	0.26	0.21	0.79	0.00	1.00	1.25	0.75	0.00	0.00	0.00
Final Sat.:	0	1354	480	373	1375	0	1794	2130	1278	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.18	0.18	0.04	0.04	0.00	0.12	0.21	0.21	0.00	0.00	0.00
Crit Moves:		****						****				
Green/Cycle:	0.00	0.41	0.41	0.41	0.41	0.00	0.48	0.48	0.48	0.00	0.00	0.00
Volume/Cap:	0.00	0.43	0.43	0.11	0.11	0.00	0.24	0.43	0.43	0.00	0.00	0.00
Delay/Veh:	0.0	16.8	16.8	13.2	13.2	0.0	11.4	12.8	12.8	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	16.8	16.8	13.2	13.2	0.0	11.4	12.8	12.8	0.0	0.0	0.0
DesignQueue:	0	6	2	0	1	0	4	9	6	0	0	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #48 Durant Avenue / Piedmont Avenue

Cycle (sec): 100 Critical Vol./Cap. (X): 0.926
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 34.2
Optimal Cycle: 0 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Stop Sign			Stop Sign			Stop Sign			Stop Sign	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		0 0 1 0 0			0 0 1 0 0			1 0 0 0 1			0 0 0 0 0	
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	398	0	0	427	0	179	0	197	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	398	0	0	427	0	179	0	197	0	0	0
Added Vol:	0	53	0	0	26	0	17	0	79	0	0	0
Future:	0	77	0	0	55	0	44	0	44	0	0	0
Initial Fut:	0	528	0	0	508	0	240	0	320	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	528	0	0	508	0	240	0	320	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	528	0	0	508	0	240	0	320	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	528	0	0	508	0	240	0	320	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	570	0	0	566	0	462	0	544	0	0	0
Capacity Analysis Module:												
Vol/Sat:	xxxx	0.93	xxxx	xxxx	0.90	xxxx	0.52	xxxx	0.59	xxxx	xxxx	xxxx
Crit Moves:		****			****				****			
Delay/Veh:	0.0	45.6	0.0	0.0	40.7	0.0	18.0	0.0	17.5	0.0	0.0	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	45.6	0.0	0.0	40.7	0.0	18.0	0.0	17.5	0.0	0.0	0.0
LOS by Move:	*	E	*	*	E	*	C	*	C	*	*	*
ApproachDel:		45.6			40.7			17.7			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		45.6			40.7			17.7			xxxxxx	
LOS by Appr:		E			E			C			*	

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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              PM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #49 Channing Way / Shattuck Avenue
******************************************************************************
Cycle (sec):         75             Critical Vol./Cap. (X):        0.799
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       9.2
Optimal Cycle:       60             Level Of Service:                 A
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16    16    16   16    16    22   22    22    22   22    22
Lanes:       1  0  1  1  0    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     83 1279    94    19 1089    49    18   76    81   144   97   106
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  83 1279    94    19 1089    49    18   76    81   144   97   106
Added Vol:     0   30     6     0  183     0     0    0     0    24    0    26
Future:       10  180    20    50  110    90    30   80    20    30   20    30
Initial Fut:  93 1489   120    69 1382   139    48  156   101   198  117   162
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   93 1489   120    69 1382   139    48  156   101   198  117   162
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  93 1489   120    69 1382   139    48  156   101   198  117   162
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   93 1489   120    69 1382   139    48  156   101   198  117   162
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  0.09 0.94  0.94  0.96 0.96  0.96  0.95 0.95  0.95
Lanes:       1.00 1.85  0.15  1.00 1.82  0.18  0.16 0.51  0.33  0.41 0.25  0.34
Final Sat.:  1900 3304   266   171 3234   325   286  928   601   752  445   616
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.45  0.45  0.40 0.43  0.43  0.17 0.17  0.17  0.26 0.26  0.26
Crit Moves:       ****                                               ****
Green/Cycle: 0.56 0.56  0.56  0.59 0.59  0.59  0.33 0.33  0.33  0.33 0.33  0.33
Volume/Cap:  0.09 0.80  0.80  0.68 0.72  0.72  0.51 0.51  0.51  0.80 0.80  0.80
Delay/Veh:    1.2  5.2   5.2  31.3  2.5   2.5  23.4 23.4  23.4  33.6 33.6  33.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   1.2  5.2   5.2  31.3  2.5   2.5  23.4 23.4  23.4  33.6 33.6  33.6
DesignQueue:    2   30     2     1   26     3     1    5     3     6    3     5
******************************************************************************
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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                              PM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
******************************************************************************
Intersection #50 Channing Way / Fulton Street
******************************************************************************
Cycle (sec):        100             Critical Vol./Cap. (X):        0.842
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):      27.6
Optimal Cycle:        0             Level Of Service:                 D
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       0  0  0  0  0    0  1  0  1  0    0  0  0  1  0    0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0     0    48  686    61     0  133    38    15  257     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0     0    48  686    61     0  133    38    15  257     0
Added Vol:     0    0     0     4   16     0     0    6     0     0   50     0
Future:        0    0     0    10  100     0     0  110    30    10   70     0
Initial Fut:   0    0     0    62  802    61     0  249    68    25  377     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0     0    62  802    61     0  249    68    25  377     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0    0     0    62  802    61     0  249    68    25  377     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0    0     0    62  802    61     0  249    68    25  377     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 0.00  0.00  0.13 1.74  0.13  0.00 0.79  0.21  0.06 0.94  0.00
Final Sat.:    0    0     0    74  964    74     0  439   120    35  528     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx  0.84 0.83  0.82  xxxx 0.57  0.57  0.71 0.71  xxxx
Crit Moves:                   ****                   ****             ****
Delay/Veh:    0.0  0.0   0.0  34.6 33.2  31.8   0.0 17.0  17.0  23.0 23.0   0.0
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  34.6 33.2  31.8   0.0 17.0  17.0  23.0 23.0   0.0
LOS by Move:    *    *     *     D    D     D     *    C     C     C    C     *
ApproachDel:     xxxxxx           33.2             17.0             23.0
Delay Adj:        xxxxx           1.00             1.00             1.00
ApprAdjDel:      xxxxxx           33.2             17.0             23.0
LOS by Appr:        *               D                C                C
******************************************************************************
```

```
-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #51 Channing Way / Telegraph Avenue
*****************************************************************************
Cycle (sec):          70               Critical Vol./Cap. (X):     OVERFLOW
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       16.5
Optimal Cycle:       180               Level Of Service:                  B
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   18   18    18     0    0     0    17   17     0     0   17    17
Lanes:       0  1  0  1  0    0  0  0  0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Sep 1997 << 4:00 - 6:00 PM
Base Vol:     86  410    41     0    0     0    23  144     0     0  227    46
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  86  410    41     0    0     0    23  144     0     0  227    46
Added Vol:     0    4     9     0    0     0     0   14     0     0   50     0
Future:       10   40    30     0    0     0     0   30    80    40   30     0
Initial Fut:  96  454    80     0    0     0    23  188    80    40  307    46
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   96  454    80     0    0     0    23  188    80    40  307    46
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  96  454    80     0    0     0    23  188    80    40  307    46
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   96  454    80     0    0     0    23  188    80    40  307    46
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.91 0.91  0.91  1.00 1.00  1.00  0.95 0.95  0.96  0.74 0.98  0.98
Lanes:       0.30 1.45  0.25  0.00 0.00  0.00  0.11 0.89  0.00  0.00 0.87  0.13
Final Sat.:   529 2504   441     0    0     0   196 1605     0     0 1626   244
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.18  0.18  0.00 0.00  0.00  0.12 0.12  xxxx  xxxx 0.19  0.19
Crit Moves:       ****                                         ****
Green/Cycle: 0.26 0.26  0.26  0.00 0.00  0.00  0.63 0.63  0.63  0.63 0.63  0.63
Volume/Cap:  0.71 0.71  0.71  0.00 0.00  0.00  0.19 0.19  xxxx  xxxx 0.30  0.30
Delay/Veh:   28.7 28.7  28.7   0.0  0.0   0.0   5.8  5.8   0.0   0.0  6.6   6.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  28.7 28.7  28.7   0.0  0.0   0.0   5.8  5.8   0.0   0.0  6.6   6.6
DesignQueue:    3   14     2     0    0     0     0    3     0     0    5     1
*****************************************************************************
```



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-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #52 Channing Way / College Avenue
*****************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):        0.608
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       15.7
Optimal Cycle:        43               Level Of Service:                  B
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   18   18    18    18   18    18    17   17    17    17   17    17
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     31  189    41     7  206    24     5   95    58   124  141    47
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  31  189    41     7  206    24     5   95    58   124  141    47
Added Vol:     3    4    -1     0   21     0     0   78    20    -4   10     0
Future:       30   60    30     0   40    10    30   40    40    40   20    30
Initial Fut:  64  253    70     7  267    34    35  213   118   160  171    77
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   64  253    70     7  267    34    35  213   118   160  171    77
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  64  253    70     7  267    34    35  213   118   160  171    77
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   64  253    70     7  267    34    35  213   118   160  171    77
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.88 0.88  0.88  0.98 0.98  0.98  0.90 0.90  0.90  0.71 0.71  0.71
Lanes:       0.17 0.65  0.18  0.02 0.87  0.11  0.10 0.58  0.32  0.39 0.42  0.19
Final Sat.:   276 1090   302    42 1608   205   164  997   552   532  569   256
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.23 0.23  0.23  0.17 0.17  0.17  0.21 0.21  0.21  0.30 0.30  0.30
Crit Moves:       ****                                              ****
Green/Cycle: 0.38 0.38  0.38  0.38 0.38  0.38  0.49 0.49  0.49  0.49 0.49  0.49
Volume/Cap:  0.61 0.61  0.61  0.43 0.43  0.43  0.43 0.43  0.43  0.61 0.61  0.61
Delay/Veh:   19.0 19.0  19.0  15.5 15.5  15.5  12.1 12.1  12.1  15.9 15.9  15.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  19.0 19.0  19.0  15.5 15.5  15.5  12.1 12.1  12.1  15.9 15.9  15.9
DesignQueue:    2    6     2     0    6     1     1    4     2     3    3     1
*****************************************************************************
```

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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #53 Haste Street / Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        1.124
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       18.9
Optimal Cycle:      180              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    22   22    0     0   22   22     0    0    0    27   27   27
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     104 1277    0     0 1208   88     0    0    0   268  336   152
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
Initial Bse:  104 1277    0     0 1208   88     0    0    0   268  336   152
Added Vol:      0   35    0     0  162   45     0    0    0    32   72     0
Future:        30  160    0     0  130   20     0    0    0    40   80    40
Initial Fut:  134 1472    0     0 1500  153     0    0    0   340  488   192
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
PHF Volume:   134 1472    0     0 1500  153     0    0    0   340  488   192
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0     0
Reduced Vol:  134 1472    0     0 1500  153     0    0    0   340  488   192
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
Final Vol.:   134 1472    0     0 1500  153     0    0    0   340  488   192
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900  1900
Adjustment:  0.10 0.95 1.00  1.00 0.94 0.94  1.00 1.00 1.00  0.90 0.90  0.90
Lanes:       1.00 2.00 0.00  0.00 1.81 0.19  0.00 0.00 0.00  0.67 0.96  0.37
Final Sat.:   190 3610    0     0 3230  329     0    0    0  1137 1632   642
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.71 0.41 0.00  0.00 0.46 0.46  0.00 0.00 0.00  0.30 0.30  0.30
Crit Moves:  ****                                                 ****
Green/Cycle: 0.53 0.53 0.00  0.00 0.53 0.53  0.00 0.00 0.00  0.36 0.36  0.36
Volume/Cap:  1.32 0.76 0.00  0.00 0.87 0.87  0.00 0.00 0.00  0.83 0.83  0.83
Delay/Veh:  202.5  6.2  0.0   0.0  9.4  9.4   0.0  0.0  0.0  28.5 28.5  28.5
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
AdjDel/Veh: 202.5  6.2  0.0   0.0  9.4  9.4   0.0  0.0  0.0  28.5 28.5  28.5
DesignQueue:    3   32    0     0   33    3     0    0    0    10   14     6
********************************************************************************
```



```
--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #54 Haste Street / Fulton Street
********************************************************************************
Cycle (sec):         80              Critical Vol./Cap. (X):        0.549
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       22.7
Optimal Cycle:       53              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0     0   25   25     0    0    0    20   20    0
Lanes:        0  0  0  0  0   0  0  1  1  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0    0     0  580  154     0    0    0    50  604     0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
Initial Bse:    0    0    0     0  580  154     0    0    0    50  604     0
Added Vol:      0    0    0     0   12    5     0    0    0     0  100     0
Future:         0    0    0     0   70   80     0    0    0    30   60     0
Initial Fut:    0    0    0     0  662  239     0    0    0    80  764     0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
PHF Volume:     0    0    0     0  662  239     0    0    0    80  764     0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0     0
Reduced Vol:    0    0    0     0  662  239     0    0    0    80  764     0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
Final Vol.:     0    0    0     0  662  239     0    0    0    80  764     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900  1900
Adjustment:  1.00 1.00 1.00  1.00 0.91 0.91  1.00 1.00 1.00  0.95 0.95  1.00
Lanes:       0.00 0.00 0.00  0.00 1.47 0.53  0.00 0.00 0.00  0.19 1.81  0.00
Final Sat.:     0    0    0     0 2546  919     0    0    0   342 3268     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00  0.00 0.26 0.26  0.00 0.00 0.00  0.23 0.23  0.00
Crit Moves:                       ****                             ****
Green/Cycle: 0.00 0.00 0.00  0.00 0.69 0.69  0.00 0.00 0.00  0.26 0.26  0.00
Volume/Cap:  0.00 0.00 0.00  0.00 0.38 0.38  0.00 0.00 0.00  0.89 0.89  0.00
Delay/Veh:    0.0  0.0  0.0   0.0  5.7  5.7   0.0  0.0  0.0  40.8 40.8   0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0  0.0   0.0  5.7  5.7   0.0  0.0  0.0  40.8 40.8   0.0
DesignQueue:    0    0    0     0   10    4     0    0    0     3   27     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #55 Haste Street / Telegraph Avenue
********************************************************************************
Cycle (sec):         70                Critical Vol./Cap. (X):        0.483
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        14.4
Optimal Cycle:       40                Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16    0    0    0    0    0    0    0    0   16   16
Lanes:       0  1  1  0  0   0  0  0  0  0   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:    186  476    0    0    0    0    0    0    0    0  470   57
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 186  476    0    0    0    0    0    0    0    0  470   57
Added Vol:     0   12    0    0    0    0    0    0    0    0  100    0
Future:       50  100    0    0    0    0    0    0    0    0   50   30
Initial Fut: 236  588    0    0    0    0    0    0    0    0  620   87
User Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:  236  588    0    0    0    0    0    0    0    0  620   87
Reduct Vol:    0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol: 236  588    0    0    0    0    0    0    0    0  620   87
PCE Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:  236  588    0    0    0    0    0    0    0    0  620   87
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.95 0.95 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.93 0.93
Lanes:      0.57 1.43 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 1.75 0.25
Final Sat.: 1034 2576    0    0    0    0    0    0    0    0 3109  436
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.23 0.23 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.20 0.20
Crit Moves:      ****                                             ****
Green/Cycle: 0.40 0.40 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.49 0.49
Volume/Cap: 0.57 0.57 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.41 0.41
Delay/Veh:  16.2 16.2  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 12.3 12.3
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 16.2 16.2  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 12.3 12.3
DesignQueue:   6   15    0    0    0    0    0    0    0    0   13    2
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #56 Haste Street / College Avenue
********************************************************************************
Cycle (sec):         70                Critical Vol./Cap. (X):        0.490
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        11.4
Optimal Cycle:       40                Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16    0    0   16   16    0    0    0   16   16   16
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     88  236    0    0  337   56    0    0    0   90  244   29
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  88  236    0    0  337   56    0    0    0   90  244   29
Added Vol:     2    7    0    0   35    1    0    0    0    0    2    0
Future:       30   70    0    0   80   30    0    0    0   30   30   40
Initial Fut: 120  313    0    0  452   87    0    0    0  120  276   69
User Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:  120  313    0    0  452   87    0    0    0  120  276   69
Reduct Vol:    0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol: 120  313    0    0  452   87    0    0    0  120  276   69
PCE Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:  120  313    0    0  452   87    0    0    0  120  276   69
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.76 0.76 1.00 1.00 0.98 0.98 1.00 1.00 1.00 0.91 0.91 0.91
Lanes:      0.28 0.72 0.00 0.00 0.84 0.16 0.00 0.00 0.00 0.51 1.19 0.30
Final Sat.:  401 1047    0    0 1558  300    0    0    0  891 2049  512
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.30 0.30 0.00 0.00 0.29 0.29 0.00 0.00 0.00 0.13 0.13 0.13
Crit Moves:      ****                                             ****
Green/Cycle: 0.61 0.61 0.00 0.00 0.61 0.61 0.00 0.00 0.00 0.27 0.27 0.27
Volume/Cap: 0.49 0.49 0.00 0.00 0.47 0.47 0.00 0.00 0.00 0.49 0.49 0.49
Delay/Veh:   6.1  6.1  0.0  0.0  5.5  5.5  0.0  0.0  0.0 23.1 23.1 23.1
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  6.1  6.1  0.0  0.0  5.5  5.5  0.0  0.0  0.0 23.1 23.1 23.1
DesignQueue:   2    5    0    0    7    1    0    0    0    3    8    2
********************************************************************************
```

```
--------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                            PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #57 Dwight Way / Martin Luther King Way
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.992
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       28.3
Optimal Cycle:      137               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      71  821    60   113  860   272    49  444   111     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   71  821    60   113  860   272    49  444   111     0    0     0
Added Vol:     17   13     0     0   15    84     0   14     4     0    0     0
Future:        10  220    10    20   90    10    20   50    10     0    0     0
Initial Fut:   98 1054    70   133  965   366    69  508   125     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    98 1054    70   133  965   366    69  508   125     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   98 1054    70   133  965   366    69  508   125     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    98 1054    70   133  965   366    69  508   125     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.64 0.64  0.64  0.61 0.61  0.61  0.90 0.90  0.90  1.00 1.00  1.00
Lanes:       0.16 1.73  0.11  0.18 1.32  0.50  0.20 1.45  0.35  0.00 0.00  0.00
Final Sat.:   195 2095   139   212 1538   583   336 2473   609     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.50 0.50  0.50  0.63 0.63  0.63  0.21 0.21  0.21  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.63 0.63  0.63  0.63 0.63  0.63  0.21 0.21  0.21  0.00 0.00  0.00
Volume/Cap:  0.79 0.79  0.79  0.99 0.99  0.99  0.99 0.99  0.99  0.00 0.00  0.00
Delay/Veh:    9.3  9.3   9.3  28.2 28.2  28.2  61.5 61.5  61.5   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   9.3  9.3   9.3  28.2 28.2  28.2  61.5 61.5  61.5   0.0  0.0   0.0
DesignQueue:    2   18     1     2   16     6     2   18     4     0    0     0
********************************************************************************
```



```
--------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                            PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #58 Dwight Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.921
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       16.3
Optimal Cycle:      101               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0 1273   123   133 1390     0    77  426   200     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1273   123   133 1390     0    77  426   200     0    0     0
Added Vol:      0   31     0     6  188     0     5   10     0     0    0     0
Future:         0  160    30    10  140     0    10   50    10     0    0     0
Initial Fut:    0 1464   153   149 1718     0    92  486   210     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1464   153   149 1718     0    92  486   210     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1464   153   149 1718     0    92  486   210     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1464   153   149 1718     0    92  486   210     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  0.24 0.95  0.95  0.88 0.88  0.88  1.00 1.00  1.00
Lanes:       0.00 1.81  0.19  1.00 2.00  0.00  0.23 1.24  0.53  0.00 0.00  0.00
Final Sat.:     0 3223   337   451 3610     0   388 2052   887     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.45  0.45  0.33 0.48  0.00  0.24 0.24  0.24  0.00 0.00  0.00
Crit Moves:       ****        ****                   ****
Green/Cycle: 0.00 0.49  0.49  0.58 0.58  0.00  0.26 0.26  0.26  0.00 0.00  0.00
Volume/Cap:  0.00 0.92  0.92  0.57 0.82  0.00  0.92 0.92  0.92  0.00 0.00  0.00
Delay/Veh:    0.0 15.7  15.7  13.5  4.5   0.0  43.8 43.8  43.8   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 15.7  15.7  13.5  4.5   0.0  43.8 43.8  43.8   0.0  0.0   0.0
DesignQueue:    0   35     4     6   34     0     3   16     7     0    0     0
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #59 Dwight Way / Fulton Street

Cycle (sec): 75 Critical Vol./Cap. (X): 0.616
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 17.3
Optimal Cycle: 45 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	21	21	0	0	0	16	16	0	0	0
Lanes:	0 0 0 0 1			2 0 0 0 0			0 0 1 1 0			0 0 0 0 0		
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	0	62	631	0	0	0	664	15	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	62	631	0	0	0	664	15	0	0	0
Added Vol:	0	0	0	12	0	0	0	16	0	0	0	0
Future:	0	0	20	100	0	0	0	60	30	0	0	0
Initial Fut:	0	0	82	743	0	0	0	740	45	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	82	743	0	0	0	740	45	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	82	743	0	0	0	740	45	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	82	743	0	0	0	740	45	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	0.87	0.59	1.00	1.00	1.00	0.94	0.94	1.00	1.00	1.00
Lanes:	0.00	0.00	1.00	2.00	0.00	0.00	0.00	1.89	0.11	0.00	0.00	0.00
Final Sat.:	0	0	1644	2245	0	0	0	3372	205	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.05	0.33	0.00	0.00	0.00	0.22	0.22	0.00	0.00	0.00
Crit Moves:				****				****				
Green/Cycle:	0.00	0.00	0.54	0.54	0.00	0.00	0.00	0.36	0.36	0.00	0.00	0.00
Volume/Cap:	0.00	0.00	0.09	0.62	0.00	0.00	0.00	0.62	0.62	0.00	0.00	0.00
Delay/Veh:	0.0	0.0	8.7	14.4	0.0	0.0	0.0	20.9	20.9	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	8.7	14.4	0.0	0.0	0.0	20.9	20.9	0.0	0.0	0.0
DesignQueue:	0	0	2	15	0	0	0	21	1	0	0	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #60 Dwight Way / Telegraph Avenue

Cycle (sec): 70 Critical Vol./Cap. (X): 0.982
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 34.3
Optimal Cycle: 132 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	15	15	0	0	0	17	17	17	0	0	0
Lanes:	0 0 1 1 0			0 0 0 0 0			0 1 0 1 0			0 0 0 0 0		
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	590	149	0	0	0	130	671	813	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	590	149	0	0	0	130	671	813	0	0	0
Added Vol:	0	4	0	0	0	0	9	19	27	0	0	0
Future:	0	132	11	0	0	0	11	66	110	0	0	0
Initial Fut:	0	726	160	0	0	0	150	756	950	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	726	160	0	0	0	150	756	950	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	726	160	0	0	0	150	756	950	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	726	160	0	0	0	150	756	950	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.92	0.92	1.00	1.00	1.00	0.81	0.81	0.81	1.00	1.00	1.00
Lanes:	0.00	1.64	0.36	0.00	0.00	0.00	0.17	0.83	1.00	0.00	0.00	0.00
Final Sat.:	0	2878	634	0	0	0	255	1283	1538	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.25	0.25	0.00	0.00	0.00	0.59	0.59	0.62	0.00	0.00	0.00
Crit Moves:		****							****			
Green/Cycle:	0.00	0.26	0.26	0.00	0.00	0.00	0.63	0.63	0.63	0.00	0.00	0.00
Volume/Cap:	0.00	0.98	0.98	0.00	0.00	0.00	0.94	0.94	0.98	0.00	0.00	0.00
Delay/Veh:	0.0	52.3	52.3	0.0	0.0	0.0	21.7	21.7	29.5	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	52.3	52.3	0.0	0.0	0.0	21.7	21.7	29.5	0.0	0.0	0.0
DesignQueue:	0	22	5	0	0	0	2	12	16	0	0	0

```
Cum+UC Proj+25 Inc PM      Fri May 7, 2004 15:08:00               Page 68-1
-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #61 Dwight Way / College Avenue
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.602
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       14.4
Optimal Cycle:       39              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0   16    16    16   16     0    15   15    15     0    0     0
Lanes:        0  0  0  1  0    0  1  0  0  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  294    52    49  374     0    34  483   129     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  294    52    49  374     0    34  483   129     0    0     0
Added Vol:      0    8     0     0   35     0     1   14     4     0    0     0
Future:         0   50    60    20   80     0    30    0    10     0    0     0
Initial Fut:    0  352   112    69  489     0    65  497   143     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  352   112    69  489     0    65  497   143     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  352   112    69  489     0    65  497   143     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  352   112    69  489     0    65  497   143     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.97  0.97  0.90 0.90  1.00  0.89 0.89  0.89  1.00 1.00  1.00
Lanes:       0.00 0.76  0.24  0.12 0.88  0.00  0.18 1.41  0.41  0.00 0.00  0.00
Final Sat.:     0 1394   443   212 1500     0   313 2395   689     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.25  0.33 0.33  0.00  0.21 0.21  0.21  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.00 0.54  0.54  0.54 0.54  0.00  0.34 0.34  0.34  0.00 0.00  0.00
Volume/Cap:  0.00 0.47  0.47  0.60 0.60  0.00  0.60 0.60  0.60  0.00 0.00  0.00
Delay/Veh:    0.0  8.5   8.5  10.5 10.5   0.0  21.3 21.3  21.3   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  8.5   8.5  10.5 10.5   0.0  21.3 21.3  21.3   0.0  0.0   0.0
DesignQueue:    0    7     2     1    9     0     2   13     4     0    0     0
*******************************************************************************
```



```
Cum+UC Proj+25 Inc PM      Fri May 7, 2004 15:08:00               Page 69-1
-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #62 Dwight Way / Piedmont Avenue / Warring Street
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.463
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       13.6
Optimal Cycle:       61              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0   29    29    29   29     0    24   24    24    24    0    24
Lanes:        0  0  1  1  0    0  1  1  0  0    1  0  1  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  527     1     8  353     0   132  162   307    53    0   112
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  527     1     8  353     0   132  162   307    53    0   112
Added Vol:      0   23     0     0  145     0     0    0    14     0    0     0
Future:         0   88    22    11   33     0    22   11    44    33    0    11
Initial Fut:    0  638    23    19  531     0   154  173   365    86    0   123
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  638    23    19  531     0   154  173   365    86    0   123
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  638    23    19  531     0   154  173   365    86    0   123
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  638    23    19  531     0   154  173   365    86    0   123
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.95  0.88 0.88  1.00  0.66 1.00  0.85  0.76 1.00  0.76
Lanes:       0.00 1.93  0.07  0.07 1.93  0.00  1.00 1.00  1.00  0.41 0.00  0.59
Final Sat.:     0 3467   125   115 3220     0  1250 1900  1615   594    0   850
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.18  0.16 0.16  0.00  0.12 0.09  0.23  0.14 0.00  0.14
Crit Moves:       ****                                       ****
Green/Cycle: 0.00 0.41  0.41  0.41 0.41  0.00  0.47 0.47  0.47  0.47 0.00  0.47
Volume/Cap:  0.00 0.44  0.44  0.40 0.40  0.00  0.26 0.19  0.48  0.31 0.00  0.31
Delay/Veh:    0.0 14.9  14.9  14.6 14.6   0.0  11.4 10.9  13.1  11.7  0.0  11.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 14.9  14.9  14.6 14.6   0.0  11.4 10.9  13.1  11.7  0.0  11.7
DesignQueue:    0   15     1     0   13     0     3    4     8     2    0     3
*******************************************************************************
```

```
------------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
------------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
************************************************************************************
Intersection #63 Dwight Avenue / Prospect Street
************************************************************************************
Average Delay (sec/veh):      6.0          Worst Case Level Of Service:         B
************************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0    0    27    0   165   187  128    0     0   93    16
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0    0    27    0   165   187  128    0     0   93    16
Added Vol:      0    0    0     0    0     0     0    0    0     0    0     0
Future:         0    0    0    10    0    20    20   20    0     0   20     0
Initial Fut:    0    0    0    37    0   185   207  148    0     0  113    16
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0    0    37    0   185   207  148    0     0  113    16
Reduct Vol:     0    0    0     0    0     0     0    0    0     0    0     0
Final Vol.:     0    0    0    37    0   185   207  148    0     0  113    16
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   683 xxxx   121   129 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   418 xxxx   936  1469 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   367 xxxx   936  1469 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *    *     *    *     *     A    *    *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  744 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.9 xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *    *     *    B     *     A    *    *     *    *     *
ApproachDel:     xxxxxx            11.9             xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```



```
------------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                               PM Peak Hour
------------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
************************************************************************************
Intersection #64 Adeline Street / Ward Avenue / Shattuck Avenue
************************************************************************************
Cycle (sec):          90               Critical Vol./Cap. (X):        0.989
Loss Time (sec):       8 (Y+R =  6 sec) Average Delay (sec/veh):        31.6
Optimal Cycle:       173               Level Of Service:                  C
************************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   25    25     0   25    25    19    0    19     0    0     0
Lanes:       0  0  0  1  0   0  0  2  0  1   2  0  0  0  1   0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  690     5     0  957   825   903    0     2     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  690     5     0  957   825   903    0     2     0    0     0
Added Vol:      0   24     0     0  164    40     7    0     0     0    0     0
Future:         0   50     0     0   50   110   130    0     0     0    0     0
Initial Fut:    0  764     5     0 1171   975  1040    0     2     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  764     5     0 1171   975  1040    0     2     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  764     5     0 1171   975  1040    0     2     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  764     5     0 1171   975  1040    0     2     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  1.00 0.95  0.85  0.92 1.00  0.85  1.00 1.00  1.00
Lanes:       0.00 0.99  0.01  0.00 2.00  1.00  2.00 0.00  1.00  0.00 0.00  1.00
Final Sat.:     0 1886    12     0 3610  1615  3502    0  1615     0    0  1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.41  0.41  0.00 0.32  0.60  0.30 0.00  0.00  0.00 0.00  0.00
Crit Moves:                              ****  ****
Green/Cycle: 0.00 0.61  0.61  0.00 0.61  0.61  0.30 0.00  0.30  0.00 0.00  0.00
Volume/Cap:  0.00 0.66  0.66  0.00 0.53  0.99  0.99 0.00  0.00  0.00 0.00  0.00
Delay/Veh:    0.0 14.5  14.5   0.0 11.0  43.2  56.5  0.0  22.1   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 14.5  14.5   0.0 11.0  43.2  56.5  0.0  22.1   0.0  0.0   0.0
DesignQueue:    0   17     0     0   25    22    39    0     0     0    0     0
************************************************************************************
```

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Cum+UC Proj+25 Inc PM      Fri May 7, 2004 15:08:00              Page 72-1
-----------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
-----------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
*****************************************************************************
Intersection #65 Derby Street / Warring Street
*****************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        1.793
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):     302.3
Optimal Cycle:        0              Level Of Service:                  F
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0  765    0    30    7   62     0    0   75   780
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0  765    0    30    7   62     0    0   75   780
Added Vol:      0    0     0  159    0     0    0    0     0    0    0    23
PasserByVol:    0    0     0  110    0    10    0    0     0    0    0   120
Initial Fut:    0    0     0 1034    0    40    7   62     0    0   75   923
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0 1034    0    40    7   62     0    0   75   923
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0 1034    0    40    7   62     0    0   75   923
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0    0     0 1034    0    40    7   62     0    0   75   923
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 0.96 0.00  0.04 0.10 0.90  0.00 0.00 0.08  0.92
Final Sat.:     0    0     0  577    0    22   53  471     0    0   51   623
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx 1.79 xxxx  1.79 0.13 0.13  xxxx xxxx 1.48  1.48
Crit Moves:                             ****      ****                  ****
Delay/Veh:    0.0  0.0   0.0 379.0 0.0 379.0 10.9 10.9   0.0  0.0  240 240.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 379.0 0.0 379.0 10.9 10.9   0.0  0.0  240 240.0
LOS by Move:    *    *     *    F    *     F    B    B     *    *    F     F
ApproachDel:     xxxxxx           379.0            10.9            240.0
Delay Adj:        xxxxx            1.00             1.00             1.00
ApprAdjDel:      xxxxxx           379.0            10.9            240.0
LOS by Appr:        *                F                B                F
*****************************************************************************
```



```
Cum+UC Proj+25 Inc PM      Fri May 7, 2004 15:08:00              Page 73-1
-----------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
-----------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #66 Derby Street / Claremont Blvd.
*****************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.857
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):      32.6
Optimal Cycle:       69              Level Of Service:                  C
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18    0    18    0    0     0    0   35    35   35   35     0
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       4    0   225    0    0     0    0  872    11   31  741     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    4    0   225    0    0     0    0  872    11   31  741     0
Added Vol:      0    0     0    0    0     0    0  159     0    0   23     0
PasserByVol:    0    0     0    0    0     0    0  120     0    0  120     0
Initial Fut:    4    0   225    0    0     0    0 1151    11   31  884     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     4    0   225    0    0     0    0 1151    11   31  884     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    4    0   225    0    0     0    0 1151    11   31  884     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     4    0   225    0    0     0    0 1151    11   31  884     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.86 1.00  0.86 1.00 1.00  1.00 1.00 1.00  1.00 0.94 0.94  1.00
Lanes:       0.02 0.00  0.98 0.00 0.00  0.00 0.00 0.99  0.01 0.03 0.97  0.00
Final Sat.:    29    0  1614    0    0     0    0 1880    18   61 1729     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.14 0.00  0.14 0.00 0.00  0.00 0.00 0.61  0.61 0.51 0.51  0.00
Crit Moves:  ****                                 ****
Green/Cycle: 0.28 0.00  0.28 0.00 0.00  0.00 0.00 0.60  0.60 0.60 0.60  0.00
Volume/Cap:  0.50 0.00  0.50 0.00 0.00  0.00 0.00 1.02  1.02 0.85 0.85  0.00
Delay/Veh:   23.7  0.0  23.7  0.0  0.0   0.0  0.0 44.9  44.9 19.2 19.2   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  23.7  0.0  23.7  0.0  0.0   0.0  0.0 44.9  44.9 19.2 19.2   0.0
DesignQueue:    0    0     6    0    0     0    0   20     0    1   15     0
*****************************************************************************
```

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------------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                             PM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #67 Ashby Avenue / Seventh Street
******************************************************************************
Cycle (sec):        110              Critical Vol./Cap. (X):        1.127
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       93.7
Optimal Cycle:      180              Level Of Service:                 F
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted      Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  1  0  1  0   0  1  0  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     134  404    68   107  270   476   263  546   113    98  774    31
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  134  404    68   107  270   476   263  546   113    98  774    31
Added Vol:      0    0     0     0    0     0     0   13     0     0   83     0
Future:        60   60    10    90   30     0    30   60    60    20   60    70
Initial Fut:  194  464    78   197  300   476   293  619   173   118  917   101
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   194  464    78   197  300   476   293  619   173   118  917   101
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  194  464    78   197  300   476   293  619   173   118  917   101
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   194  464    78   197  300   476   293  619   173   118  917   101
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.48 0.48  0.48  0.52 0.52  0.52  0.95 0.92  0.92  0.95 0.94  0.94
Lanes:       0.53 1.26  0.21  0.40 0.62  0.98  1.00 1.56  0.44  1.00 1.80  0.20
Final Sat.:   481 1151   194   401  611   969  1805 2728   763  1805 3203   353
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.40 0.40  0.40  0.49 0.49  0.49  0.16 0.23  0.23  0.07 0.29  0.29
Crit Moves:                        ****             ****             ****
Green/Cycle: 0.44 0.44  0.44  0.44 0.44  0.44  0.20 0.20  0.20  0.25 0.25  0.25
Volume/Cap:  0.93 0.93  0.93  1.13 1.13  1.13  0.81 1.13  1.13  0.26 1.13  1.13
Delay/Veh:   47.5 47.5  47.5 103.0  103 103.0  61.4  121 121.0  34.7  113 113.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  47.5 47.5  47.5 103.0  103 103.0  61.4  121 121.0  34.7  113 113.3
DesignQueue:    7   17     3     7   11    18    15   32     9     5   45     5
******************************************************************************
```



```
------------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                             PM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #68 Ashby Avenue / San Pablo Avenue
******************************************************************************
Cycle (sec):        110              Critical Vol./Cap. (X):        0.889
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       40.8
Optimal Cycle:       98              Level Of Service:                 D
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    4   17    17    4   19    19   18   18    18   18   18    18
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     162  999    79   185  873   113    86  592   170    20  612   143
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  162  999    79   185  873   113    86  592   170    20  612   143
Added Vol:     13   26    28     0   14    16     0   11     3    58   54     0
Future:        20  190    90    20  320    30    20   90    50    40   90    30
Initial Fut:  195 1215   197   205 1207   159   106  693   223   118  756   173
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   195 1215   197   205 1207   159   106  693   223   118  756   173
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  195 1215   197   205 1207   159   106  693   223   118  756   173
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   195 1215   197   205 1207   159   106  693   223   118  756   173
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.93  0.93  1.00 0.92  0.92  0.88 0.88  0.88
Lanes:       1.00 1.72  0.28  1.00 1.77  0.23  1.00 1.51  0.49  0.23 1.44  0.33
Final Sat.:  1805 3041   493  1805 3136   413  1900 2633   847   379 2427   555
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.40  0.40  0.11 0.38  0.38  0.06 0.26  0.26  0.31 0.31  0.31
Crit Moves:       ****        ****                                   ****
Green/Cycle: 0.13 0.50  0.50  0.11 0.48  0.48  0.31 0.31  0.31  0.31 0.31  0.31
Volume/Cap:  0.80 0.80  0.80  0.99 0.80  0.80  0.18 0.84  0.84  0.99 0.99  0.99
Delay/Veh:   63.4 25.6  25.6 109.8 27.1  27.1  26.9 40.3  40.3  63.2 63.2  63.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  63.4 25.6  25.6 109.8 27.1  27.1  26.9 40.3  40.3  63.2 63.2  63.2
DesignQueue:   11   41     7    11   42     6     5   31    10     5   34     8
******************************************************************************
```

```
------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
             Cumulative (2020) + UCB LRDP Project + Increment to '25
                              PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
             2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #69 Ashby Avenue / Adeline Street
******************************************************************************
Cycle (sec):        140              Critical Vol./Cap. (X):        0.623
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       39.4
Optimal Cycle:       86              Level Of Service:                 D
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    4   32    32    6   38    38    4   22    22    4   32    32
Lanes:       1  0  1  1  0   1  0  2  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     92  693    85    31  700   169   135  491    39    68  547    39
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  92  693    85    31  700   169   135  491    39    68  547    39
Added Vol:     1    1     0     0    6    34     5   22     4     0   57     0
Future:       60   70    10    10   10    80    50  160    20    10   50    10
Initial Fut: 153  764    95    41  716   283   190  673    63    78  654    49
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:  153  764    95    41  716   283   190  673    63    78  654    49
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 153  764    95    41  716   283   190  673    63    78  654    49
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:  153  764    95    41  716   283   190  673    63    78  654    49
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.87  0.87  0.95 0.94  0.94  0.95 0.94  0.94
Lanes:       1.00 1.78  0.22  1.00 2.15  0.85  1.00 1.83  0.17  1.00 1.86  0.14
Final Sat.:  1805 3156   392  1805 3561  1408  1805 3258   305  1805 3325   249
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.24  0.24  0.02 0.20  0.20  0.11 0.21  0.21  0.04 0.20  0.20
Crit Moves:  ****                  ****        ****                   ****
Green/Cycle: 0.14 0.42  0.42  0.04 0.32  0.32  0.17 0.40  0.40  0.08 0.32  0.32
Volume/Cap:  0.62 0.58  0.58  0.53 0.62  0.62  0.62 0.52  0.52  0.52 0.62  0.62
Delay/Veh:   62.0 32.1  32.1  72.4 41.0  41.0  61.9 28.7  28.7  71.5 40.8  40.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  62.0 32.1  32.1  72.4 41.0  41.0  61.9 28.7  28.7  71.5 40.8  40.8
DesignQueue:   11   37     5     3   40    16    13   33     3     6   37     3
******************************************************************************
```



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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
             Cumulative (2020) + UCB LRDP Project + Increment to '25
                              PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
             2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #70 Ashby Avenue / Shattuck Avenue
******************************************************************************
Cycle (sec):         80              Critical Vol./Cap. (X):        0.731
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       41.5
Optimal Cycle:       60              Level Of Service:                 D
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   21   21    21    6   21    21   20   20    20   20   20    20
Lanes:       0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     52  556    30   200  585    56    33  536    40    32  541   176
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  52  556    30   200  585    56    33  536    40    32  541   176
Added Vol:     0   13     0    15   93    56     7   14     0     0    1     3
Future:       10   10    10    20   20    10    10  170    20    10   60    20
Initial Fut:  62  579    40   235  698   122    50  720    60    42  602   199
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   62  579    40   235  698   122    50  720    60    42  602   199
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  62  579    40   235  698   122    50  720    60    42  602   199
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   62  579    40   235  698   122    50  720    60    42  602   199
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.49 0.49  0.49  0.89 0.89  0.89  0.90 0.90  0.90  0.88 0.88  0.88
Lanes:       0.18 1.70  0.12  0.45 1.32  0.23  0.12 1.74  0.14  0.10 1.43  0.47
Final Sat.:   168 1573   109   755 2242   392   205 2958   246   166 2376   785
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.37 0.37  0.37  0.31 0.31  0.31  0.24 0.24  0.24  0.25 0.25  0.25
Crit Moves:       ****                                                ****
Green/Cycle: 0.33 0.33  0.33  0.32 0.32  0.32  0.52 0.52  0.52  0.52 0.52  0.52
Volume/Cap:  1.13 1.13  1.13  0.96 0.96  0.96  0.46 0.46  0.46  0.48 0.48  0.48
Delay/Veh:  106.1  106 106.1  45.2 45.2  45.2  12.8 12.8  12.8  13.0 13.0  13.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 106.1  106 106.1  45.2 45.2  45.2  12.8 12.8  12.8  13.0 13.0  13.0
DesignQueue:    2   18     1     8   23     4     1   16     1     1   13     4
******************************************************************************
```

```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #71 Ashby Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):         80                Critical Vol./Cap. (X):        1.003
Loss Time (sec):     12 (Y+R =  6 sec) Average Delay (sec/veh):        26.9
Optimal Cycle:      105                Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected       Prot+Permit       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    21   21    21    6   21    21   25   25    25   25   25    25
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     210  675    75  176  902    63   68  531   184  148  642    99
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  210  675    75  176  902    63   68  531   184  148  642    99
Added Vol:      1    4     0    2   25     0    0   26     3    0    3     0
Future:        30   80    10   10   60    10   30  110    50   20   50    20
Initial Fut:  241  759    85  188  987    73   98  667   237  168  695   119
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   241  759    85  188  987    73   98  667   237  168  695   119
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  241  759    85  188  987    73   98  667   237  168  695   119
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   241  759    85  188  987    73   98  667   237  168  695   119
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.94  0.94 0.56 0.94  0.94 0.95 0.91  0.91 0.95 0.93  0.93
Lanes:       1.00 1.80  0.20 1.00 1.86  0.14 1.00 1.48  0.52 1.00 1.71  0.29
Final Sat.:  1805 3198   358 1070 3328   246 1805 2560   910 1805 3014   516
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.24  0.24 0.18 0.30  0.30 0.05 0.26  0.26 0.09 0.23  0.23
Crit Moves:  ****                **                ****        ****
Green/Cycle: 0.35 0.35  0.35 0.94 0.46  0.46 0.35 0.35  0.35 0.35 0.35  0.35
Volume/Cap:  0.38 0.68  0.68 0.19 0.65  0.65 0.16 0.74  0.74 0.27 0.66  0.66
Delay/Veh:   25.7 30.2  30.2  3.0 20.1  20.1 23.8 33.9  33.9 25.3 31.3  31.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  25.7 30.2  30.2  3.0 20.1  20.1 23.8 33.9  33.9 25.3 31.3  31.3
DesignQueue:    9   30     3    6   33     2    4   27    10    6   28     5
********************************************************************************
```



```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #72 Ashby Avenue / College Avenue
********************************************************************************
Cycle (sec):         80                Critical Vol./Cap. (X):        0.965
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        37.8
Optimal Cycle:      131                Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18   18   18    18   30   30    30   30   30    30
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      75  293    68  159  279    58   15  683    87   10  466   151
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   75  293    68  159  279    58   15  683    87   10  466   151
Added Vol:      0    2     0   25   16    -2    2   25     0    0    5     4
Future:        10   60    10   20   60    10   10  120    20   10   60    30
Initial Fut:   85  355    78  204  355    66   27  828   107   20  531   185
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    85  355    78  204  355    66   27  828   107   20  531   185
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   85  355    78  204  355    66   27  828   107   20  531   185
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    85  355    78  204  355    66   27  828   107   20  531   185
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.77 0.77  0.77 0.99 0.99  0.99 0.99 0.99  0.99 0.97 0.97  0.97
Lanes:       0.16 0.69  0.15 0.33 0.57  0.10 0.03 0.86  0.11 0.03 0.72  0.25
Final Sat.:   240 1002   220  611 1064   198   53 1611   208   50 1324   461
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.35 0.35  0.35 0.33 0.33  0.33 0.51 0.51  0.51 0.40 0.40  0.40
Crit Moves:       ****                              ****
Green/Cycle: 0.38 0.38  0.38 0.38 0.38  0.38 0.53 0.53  0.53 0.53 0.53  0.53
Volume/Cap:  0.95 0.95  0.95 0.89 0.89  0.89 0.98 0.98  0.98 0.76 0.76  0.76
Delay/Veh:   51.2 51.2  51.2 39.1 39.1  39.1 42.7 42.7  42.7 20.8 20.8  20.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  51.2 51.2  51.2 39.1 39.1  39.1 42.7 42.7  42.7 20.8 20.8  20.8
DesignQueue:    3   11     2    6   11     2    1   20     3    0   12     4
********************************************************************************
```

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-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                              PM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #73 Ashby Avenue / Claremont Avenue
*****************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.773
Loss Time (sec):     12 (Y+R = 12 sec) Average Delay (sec/veh):       26.3
Optimal Cycle:       72              Level Of Service:                  C
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   16   16    16   16   16    16   28   28    28   28   28    28
Lanes:       0  1  0  1  0   1  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      45  373   189  432  285    49   47  592     5   66  504   232
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   45  373   189  432  285    49   47  592     5   66  504   232
Added Vol:      0    0     0  159    0     0    0   50     0    0    9    23
Future:        10   60    20   60   50    20   40  130    10   10   60    20
Initial Fut:   55  433   209  651  335    69   87  772    15   76  573   275
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    55  433   209  651  335    69   87  772    15   76  573   275
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   55  433   209  651  335    69   87  772    15   76  573   275
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    55  433   209  651  335    69   87  772    15   76  573   275
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
Lanes:       0.16 1.24  0.60 1.85 0.95  0.20 0.20 1.77  0.03 0.16 1.24  0.60
Final Sat.:   285 2243  1082 3341 1719   354  359 3189    62  297 2239  1074
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.19  0.19 0.19 0.19  0.19 0.24 0.24  0.24 0.26 0.26  0.26
Crit Moves:  ****           ****                                  ****
Green/Cycle: 0.22 0.22  0.22 0.22 0.22  0.22 0.39 0.39  0.39 0.39 0.39  0.39
Volume/Cap:  0.87 0.87  0.87 0.88 0.88  0.88 0.62 0.62  0.62 0.66 0.66  0.66
Delay/Veh:   37.0 37.0  37.0 34.6 34.6  34.6 16.9 16.9  16.9 17.5 17.5  17.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  37.0 37.0  37.0 34.6 34.6  34.6 16.9 16.9  16.9 17.5 17.5  17.5
DesignQueue:    2   14     7   21   11     2    2   20     0    2   15     7
*****************************************************************************
```



```
-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
           Cumulative (2020) + UCB LRDP Project + Increment to '25
                              PM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #74 Tunnel Road / SR 13
*****************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.882
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       15.9
Optimal Cycle:       76              Level Of Service:                  B
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include            Ovl
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  2  0  1   2  0  1  0  0   0  0  0  0  0   1  0  0  0  2
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0 1130   256  534 1095     0    0    0     0  128    0   155
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0 1130   256  534 1095     0    0    0     0  128    0   155
Added Vol:      0   31     0  110   99     0    0    0     0    0    0     0
Future:         0   80     0   70  140     0    0    0     0    0    0    10
Initial Fut:    0 1241   256  714 1334     0    0    0     0  128    0   165
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0 1241   256  714 1334     0    0    0     0  128    0   165
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0 1241   256  714 1334     0    0    0     0  128    0   165
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0 1241   256  714 1334     0    0    0     0  128    0   165
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.95  0.85 0.92 1.00  1.00 1.00 1.00  1.00 0.95 1.00  0.75
Lanes:       0.00 2.00  1.00 2.00 1.00  0.00 0.00 0.00  0.00 1.00 0.00  2.00
Final Sat.:     0 3610  1615 3502 1900     0    0    0     0 1805    0  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.34  0.16 0.20 0.70  0.00 0.00 0.00  0.00 0.07 0.00  0.06
Crit Moves:  ****                ****                        ****
Green/Cycle: 0.00 0.50  0.50 0.30 0.80  0.00 0.00 0.00  0.00 0.08 0.00  0.38
Volume/Cap:  0.00 0.69  0.32 0.69 0.88  0.00 0.00 0.00  0.00 0.88 0.00  0.15
Delay/Veh:    0.0 13.5   9.9 22.2 10.9   0.0  0.0  0.0   0.0 71.4  0.0  13.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 13.5   9.9 22.2 10.9   0.0  0.0  0.0   0.0 71.4  0.0  13.5
DesignQueue:    0   25     5   19   12     0    0    0     0    4    0     4
*****************************************************************************
```

```
-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #167 Piedmont Avenue / Channing Way
*******************************************************************************
Average Delay (sec/veh): OVERFLOW         Worst Case Level Of Service:       F
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      85  311    45    43  406    85    42   59    87    36  109    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   85  311    45    43  406    85    42   59    87    36  109    15
Added Vol:      4   17     0     0  104     1    36    0    41     0    0     0
Future:        14   53     8     7   69    14     7   10    15     6   19     3
Initial Fut:  103  381    53    50  579   100    85   69   143    42  128    18
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   103  381    53    50  579   100    85   69   143    42  128    18
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   103  381    53    50  579   100    85   69   143    42  128    18
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  679 xxxx xxxxx   434 xxxx xxxxx  1416 1369   629  1449 1393   408
Potent Cap.:  923 xxxx xxxxx  1136 xxxx xxxxx   116  148   486   110  143   648
Move Cap.:    923 xxxx xxxxx  1136 xxxx xxxxx     0  124   486    39  120   648
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.4 xxxx xxxxx   8.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx   87 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  641 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            641.3
ApproachLOS:        *                *                F                F
```



```
-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #1121 Highland Place / Heart Avenue / Cyclotron Road
*******************************************************************************
Average Delay (sec/veh):      0.8         Worst Case Level Of Service:       C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        1  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       2    0     0     5    2    13    11   56     0     0  342    43
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    2    0     0     5    2    13    11   56     0     0  342    43
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         1    0     0     2    1     6     5   26     0     0  161    20
Initial Fut:    3    0     0     7    3    19    16   82     0     0  503    63
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     3    0     0     7    3    19    16   82     0     0  503    63
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     3    0     0     7    3    19    16   82     0     0  503    63
Critical Gap Module:
Critical Gp:  7.1 xxxx xxxxx   7.1  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5 xxxx xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  660 xxxx xxxxx   649  649   535   566 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  379 xxxx xxxxx   386  392   550  1016 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    360 xxxx xxxxx   381  385   550  1016 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 15.1 xxxx xxxxx xxxxx xxxx xxxxx   8.6 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    C    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  478 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 13.0 xxxxx   8.6 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:      15.1             13.0           xxxxxx           xxxxxx
ApproachLOS:        C                B                *                *
```

```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
            Cumulative (2020) + UCB LRDP Project + Increment to '25
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1122 Stadium Rim Road / Canyon Road
********************************************************************************
Average Delay (sec/veh):      0.2          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  1  0    0  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  265     3     0  251     0     0    0     0     6    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  265     3     0  251     0     0    0     0     6    0     1
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0   44     1     0   43     0     0    0     0     1    0     0
Initial Fut:    0  309     4     0  294     0     0    0     0     7    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  309     4     0  294     0     0    0     0     7    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  309     4     0  294     0     0    0     0     7    0     1
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   605 xxxx   311
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   464 xxxx   734
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   464 xxxx   734
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  486 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.5 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    B     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            12.5
ApproachLOS:        *                *                *                B
```

Project Scenario—A.M. Peak Hour

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Marin Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        1.021
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):        94.0
Optimal Cycle:      180               Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     102  363   59   106  891   15    38  672  235   147  768   90
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  102  363   59   106  891   15    38  672  235   147  768   90
Added Vol:      1   14    1     7  148    0     0   20    8     4    2    2
Future:       120  120   64    20  131   14    14   67   30    34  267   10
Initial Fut:  223  497  124   133 1170   29    52  759  273   185 1037  102
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   223  497  124   133 1170   29    52  759  273   185 1037  102
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  223  497  124   133 1170   29    52  759  273   185 1037  102
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   223  497  124   133 1170   29    52  759  273   185 1037  102
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.95 0.92 0.92  0.95 0.95 0.95  0.95 0.91 0.91  0.95 0.94 0.94
Lanes:       1.00 1.60 0.40  1.00 1.95 0.05  1.00 1.47 0.53  1.00 1.82 0.18
Final Sat.:  1805 2802  699  1805 3509   87  1805 2549  917  1805 3244  319
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.18 0.18  0.07 0.33 0.33  0.03 0.30 0.30  0.10 0.32 0.32
Crit Moves:  ****                 ****             ****        ****
Green/Cycle: 0.12 0.36 0.36  0.12 0.36 0.36  0.17 0.21 0.21  0.15 0.31 0.31
Volume/Cap:  1.03 0.49 0.49  0.61 0.93 0.93  0.17 1.42 1.42  0.68 1.03 1.03
Delay/Veh:  113.1 25.2 25.2  47.0 42.2 42.2  35.7  236 235.7  47.3 69.9 69.9
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh: 113.1 25.2 25.2  47.0 42.2 42.2  35.7  236 235.7  47.3 69.9 69.9
DesignQueue:   11   18    5     7   45    1     2   36   13     9   43    4
********************************************************************************
```



```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Marin Avenue / The Alameda
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.666
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        15.4
Optimal Cycle:       56               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    25   25   25    25   25   25    23   23   23    23   23   23
Lanes:        0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     173  189    7    38  279   23    33  494  291    20  420   48
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  173  189    7    38  279   23    33  494  291    20  420   48
Added Vol:      3    1    1     0    5    0     0   18    9     5    5    0
Future:       110    0   10    10  190   20     0   70   50    10  170   10
Initial Fut:  286  190   18    48  474   43    33  582  350    35  595   58
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   286  190   18    48  474   43    33  582  350    35  595   58
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  286  190   18    48  474   43    33  582  350    35  595   58
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   286  190   18    48  474   43    33  582  350    35  595   58
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.55 0.55 0.55  0.83 0.83 0.83  0.82 0.82 0.82  0.83 0.83 0.83
Lanes:       1.00 0.91 0.09  0.17 1.68 0.15  0.07 1.21 0.72  0.10 1.73 0.17
Final Sat.:  1036  947   90   267 2639  239   107 1889 1136   160 2712  264
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.28 0.20 0.20  0.18 0.18 0.18  0.31 0.31 0.31  0.22 0.22 0.22
Crit Moves:  ****                                  ****
Green/Cycle: 0.41 0.41 0.41  0.41 0.41 0.41  0.46 0.46 0.46  0.46 0.46 0.46
Volume/Cap:  0.67 0.48 0.48  0.43 0.43 0.43  0.67 0.67 0.67  0.47 0.47 0.47
Delay/Veh:   20.1 15.6 15.6  14.6 14.6 14.6  16.0 16.0 16.0  13.1 13.1 13.1
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  20.1 15.6 15.6  14.6 14.6 14.6  16.0 16.0 16.0  13.1 13.1 13.1
DesignQueue:    6    4    0     1   10    1     1   12    7     1   12    1
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Gilman Street / Sixth Street
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.688
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       16.5
Optimal Cycle:       46              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    19   19    19   19   19    19   19   19    19   19   19    19
Lanes:        0  0  1! 0  0   0  1  0  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     122   24    56   11   45    28   21  416   114   47  430    20
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  122   24    56   11   45    28   21  416   114   47  430    20
Added Vol:      1    0     0    0    0     0    0    1    10    0    0     0
Future:        70    0    28    0   30     0    0   37    10   48   67     0
Initial Fut:  193   24    84   11   75    28   21  454   134   95  497    20
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   193   24    84   11   75    28   21  454   134   95  497    20
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  193   24    84   11   75    28   21  454   134   95  497    20
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   193   24    84   11   75    28   21  454   134   95  497    20
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.70 0.70  0.70 0.84 0.84  0.84 0.95 0.95  0.95 0.85 0.85  0.85
Lanes:       0.64 0.08  0.28 0.19 1.32  0.49 0.03 0.75  0.22 0.16 0.81  0.03
Final Sat.:   858  107   373  310 2111   788   62 1341   396  251 1314    53
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.22  0.22 0.04 0.04  0.04 0.34 0.34  0.34 0.38 0.38  0.38
Crit Moves:       ****                                           ****
Green/Cycle: 0.33 0.33  0.33 0.33 0.33  0.33 0.55 0.55  0.55 0.55 0.55  0.55
Volume/Cap:  0.69 0.69  0.69 0.11 0.11  0.11 0.62 0.62  0.62 0.69 0.69  0.69
Delay/Veh:   27.5 27.5  27.5 15.5 15.5  15.5 12.8 12.8  12.8 14.9 14.9  14.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  27.5 27.5  27.5 15.5 15.5  15.5 12.8 12.8  12.8 14.9 14.9  14.9
DesignQueue:    5    1     2    0    2     1    0    8     2    2    9     0
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #4 Gilman Street / San Pablo Avenue
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.895
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       46.5
Optimal Cycle:      108              Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     4   35    35    4   35    35   31   31    31   31   31    31
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     113  401    25   74 1055   125   75  189    96   62  318    42
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  113  401    25   74 1055   125   75  189    96   62  318    42
Added Vol:      0   16     0    0  159     0    0    0     1    0    0     0
Future:        30  305    60   60   70    20   35   20    10   10   40    32
Initial Fut:  143  722    85  134 1284   145  110  209   107   72  358    74
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   143  722    85  134 1284   145  110  209   107   72  358    74
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  143  722    85  134 1284   145  110  209   107   72  358    74
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   143  722    85  134 1284   145  110  209   107   72  358    74
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.93  0.93 0.95 0.94  0.94 0.56 0.56  0.56 0.86 0.86  0.86
Lanes:       1.00 1.79  0.21 1.00 1.80  0.20 0.52 0.98  0.50 0.14 0.71  0.15
Final Sat.:  1805 3178   374 1805 3195   361  549 1043   534  235 1167   241
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.23  0.23 0.07 0.40  0.40 0.20 0.20  0.20 0.31 0.31  0.31
Crit Moves:  ****                 ****                                ****
Green/Cycle: 0.00 0.37  0.00 0.00 0.37  0.00 0.37 0.37  0.37 0.37 0.37  0.37
Volume/Cap:  xxxx 0.61  xxxx xxxx 1.09  xxxx 0.55 0.55  0.55 0.84 0.84  0.84
Delay/Veh:    0.0 27.8   0.0  0.0 83.2   0.0 28.0 28.0  28.0 42.5 42.5  42.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 27.8   0.0  0.0 83.2   0.0 28.0 28.0  28.0 42.5 42.5  42.5
DesignQueue:    8   27     5    8   50     9    4    8     4    3   14     3
********************************************************************************
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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Rose Street / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.574
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       9.9
Optimal Cycle:       52              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   17   17    17    17   17    17    27   27    27    27   27    27
Lanes:       1  0  1  1  0   1  0  1  1  0   0  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     55  191    11   174  961    28    28  174    40    32  185    40
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  55  191    11   174  961    28    28  174    40    32  185    40
Added Vol:     0    1     0     4   11     0     0    0     0     0    0     0
Future:       40  140    20    10  170    10    10   10    20    20   10    10
Initial Fut:  95  332    31   188 1142    38    38  184    60    52  195    50
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   95  332    31   188 1142    38    38  184    60    52  195    50
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  95  332    31   188 1142    38    38  184    60    52  195    50
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   95  332    31   188 1142    38    38  184    60    52  195    50
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.17 0.94  0.94  0.53 0.95  0.95  0.91 0.91  0.85  0.89 0.89  0.89
Lanes:      1.00 1.83  0.17  1.00 1.94  0.06  0.17 0.83  1.00  0.17 0.66  0.17
Final Sat.:  331 3259   304  1015 3476   116   297 1438  1615   297 1114   286
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.29 0.10  0.10  0.19 0.33  0.33  0.13 0.13  0.04  0.18 0.18  0.18
Crit Moves:                       ****                                ****
Green/Cycle: 0.46 0.46  0.46  0.46 0.46  0.46  0.42 0.42  0.42  0.42 0.42  0.42
Volume/Cap:  0.62 0.22  0.22  0.40 0.71  0.71  0.31 0.31  0.09  0.42 0.42  0.42
Delay/Veh:   23.3  4.8   4.8   7.5  8.6   8.6  13.8 13.8  11.8  15.3 15.3  15.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  23.3  4.8   4.8   7.5  8.6   8.6  13.8 13.8  11.8  15.3 15.3  15.3
DesignQueue:    2    7     1     4   24     1     1    4     1     1    4     1
********************************************************************************
```



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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #6 Cedar Street / Martin Luther King Way
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.984
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):      33.7
Optimal Cycle:      126              Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   20   20    20    20   20    20    20   20    20    20   20    20
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     33  292    44    35  617    26    14  276    62    58  248    30
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  33  292    44    35  617    26    14  276    62    58  248    30
Added Vol:     0    3     1     0   16     0     0   14     1     4    2     0
Future:       10   40    20    20  220    10    10   50    30    30   90    20
Initial Fut:  43  335    65    55  853    36    24  340    93    92  340    50
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   43  335    65    55  853    36    24  340    93    92  340    50
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  43  335    65    55  853    36    24  340    93    92  340    50
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   43  335    65    55  853    36    24  340    93    92  340    50
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.85 0.85  0.85  0.95 0.95  0.95  0.94 0.94  0.94  0.75 0.75  0.75
Lanes:      0.10 0.75  0.15  0.06 0.90  0.04  0.05 0.75  0.20  0.19 0.71  0.10
Final Sat.:  158 1228   238   105 1631    69    94 1329   363   270  999   147
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.27 0.27  0.27  0.52 0.52  0.52  0.26 0.26  0.26  0.34 0.34  0.34
Crit Moves:                       ****                                ****
Green/Cycle: 0.53 0.53  0.53  0.53 0.53  0.53  0.35 0.35  0.35  0.35 0.35  0.35
Volume/Cap:  0.51 0.51  0.51  0.98 0.98  0.98  0.74 0.74  0.74  0.98 0.98  0.98
Delay/Veh:    9.2  9.2   9.2  36.2 36.2  36.2  26.5 26.5  26.5  58.1 58.1  58.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   9.2  9.2   9.2  36.2 36.2  36.2  26.5 26.5  26.5  58.1 58.1  58.1
DesignQueue:    1    6     1     1   17     1     1    9     2     2    9     1
********************************************************************************
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365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #7 Cedar Street / Shattuck Avenue

Cycle (sec):	65	Critical Vol./Cap. (X):	0.627
Loss Time (sec):	8 (Y+R = 5 sec)	Average Delay (sec/veh):	10.5
Optimal Cycle:	50	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	20	20	20	20	20	20	22	22	22	22	22	22
Lanes:	1 0 1 1 0			1 0 1 1 0			1 0 0 1 0			1 0 0 1 0		
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	48	256	41	127	933	52	44	257	86	94	268	56
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	48	256	41	127	933	52	44	257	86	94	268	56
Added Vol:	0	1	0	2	10	0	0	14	0	4	6	0
Future:	20	140	20	10	150	10	10	30	10	40	70	20
Initial Fut:	68	397	61	139	1093	62	54	301	96	138	344	76
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	68	397	61	139	1093	62	54	301	96	138	344	76
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	68	397	61	139	1093	62	54	301	96	138	344	76
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	68	397	61	139	1093	62	54	301	96	138	344	76
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.22	0.93	0.93	0.48	0.94	0.94	0.33	0.96	0.96	0.35	0.97	0.97
Lanes:	1.00	1.73	0.27	1.00	1.89	0.11	1.00	0.76	0.24	1.00	0.82	0.18
Final Sat.:	422	3067	471	920	3389	192	621	1389	443	673	1514	335
Capacity Analysis Module:												
Vol/Sat:	0.16	0.13	0.13	0.15	0.32	0.32	0.09	0.22	0.22	0.21	0.23	0.23
Crit Moves:					****						****	
Green/Cycle:	0.51	0.51	0.51	0.51	0.51	0.51	0.36	0.36	0.36	0.36	0.36	0.36
Volume/Cap:	0.31	0.25	0.25	0.29	0.63	0.63	0.24	0.60	0.60	0.57	0.63	0.63
Delay/Veh:	6.4	2.9	2.9	4.2	4.9	4.9	17.0	20.8	20.8	25.8	21.5	21.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.4	2.9	2.9	4.2	4.9	4.9	17.0	20.8	20.8	25.8	21.5	21.5
DesignQueue:	1	7	1	2	21	1	1	7	2	3	8	2

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #8 Cedar Street / Oxford Street

Cycle (sec):	65	Critical Vol./Cap. (X):	1.030
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	58.2
Optimal Cycle:	178	Level Of Service:	E

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	16	16	16	16	16	16	16	16	16	16	16	16
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	45	186	56	34	531	19	18	314	75	144	343	19
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	45	186	56	34	531	19	18	314	75	144	343	19
Added Vol:	2	13	0	0	115	9	1	0	16	0	0	0
Future:	30	20	10	10	10	0	10	40	30	10	120	0
Initial Fut:	77	219	66	44	656	28	29	354	121	154	463	19
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	77	219	66	44	656	28	29	354	121	154	463	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	219	66	44	656	28	29	354	121	154	463	19
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	77	219	66	44	656	28	29	354	121	154	463	19
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.76	0.76	0.76	0.96	0.96	0.96	0.92	0.92	0.92	0.67	0.67	0.67
Lanes:	0.21	0.61	0.18	0.06	0.90	0.04	0.06	0.70	0.24	0.24	0.73	0.03
Final Sat.:	306	871	262	110	1639	70	101	1234	422	306	920	38
Capacity Analysis Module:												
Vol/Sat:	0.25	0.25	0.25	0.40	0.40	0.40	0.29	0.29	0.29	0.50	0.50	0.50
Crit Moves:					****						****	
Green/Cycle:	0.50	0.49	0.49	0.50	0.50	0.50	0.40	0.39	0.39	0.40	0.40	0.40
Volume/Cap:	0.50	0.51	0.51	0.80	0.80	0.80	0.73	0.75	0.75	1.27	1.27	1.27
Delay/Veh:	10.8	11.5	11.5	17.7	17.7	17.7	23.2	24.6	24.6	157.8	158	157.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.8	11.5	11.5	17.7	17.7	17.7	23.2	24.6	24.6	157.8	158	157.8
DesignQueue:	1	4	1	1	13	1	1	8	3	4	11	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Cedar Street / Euclid Avenue

Cycle (sec): 60 Critical Vol./Cap. (X): 0.599
Loss Time (sec): 8 (Y+R = 5 sec) Average Delay (sec/veh): 13.8
Optimal Cycle: 42 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	17	17	17	17	17	17	17	17	17	17	17	17
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	30	85	29	23	295	141	50	143	117	28	209	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	30	85	29	23	295	141	50	143	117	28	209	8
Added Vol:	0	0	0	0	11	3	0	-2	0	0	0	0
Future:	20	0	0	0	10	40	10	30	20	20	80	0
Initial Fut:	50	85	29	23	316	184	60	171	137	48	289	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	50	85	29	23	316	184	60	171	137	48	289	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	50	85	29	23	316	184	60	171	137	48	289	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	50	85	29	23	316	184	60	171	137	48	289	8
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.78	0.78	0.78	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Lanes:	0.30	0.52	0.18	0.04	0.61	0.35	0.16	0.47	0.37	0.14	0.84	0.02
Final Sat.:	452	769	262	78	1076	627	266	759	608	242	1457	40
Capacity Analysis Module:												
Vol/Sat:	0.11	0.11	0.11	0.29	0.29	0.29	0.23	0.23	0.23	0.20	0.20	0.20
Crit Moves:					****			****				
Green/Cycle:	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Volume/Cap:	0.23	0.23	0.23	0.60	0.60	0.60	0.60	0.60	0.60	0.53	0.53	0.53
Delay/Veh:	8.9	8.9	8.9	12.2	12.2	12.2	16.7	16.7	16.7	15.4	15.4	15.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.9	8.9	8.9	12.2	12.2	12.2	16.7	16.7	16.7	15.4	15.4	15.4
DesignQueue:	1	1	1	0	6	3	1	4	3	1	6	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #10 Grizzly Peak Blvd / Centennial Drive

Cycle (sec): 100 Critical Vol./Cap. (X): 0.495
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 11.4
Optimal Cycle: 0 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Stop Sign			Stop Sign			Stop Sign			Stop Sign	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 4 Dec 2002 << 7:00-9:00 AM												
Base Vol:	31	13	13	25	52	4	6	165	143	169	90	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	31	13	13	25	52	4	6	165	143	169	90	16
Added Vol:	1	0	4	0	0	0	0	0	7	43	0	0
Future:	33	0	11	0	0	0	0	22	11	22	11	0
Initial Fut:	65	13	28	25	52	4	6	187	161	234	101	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	65	13	28	25	52	4	6	187	161	234	101	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	65	13	28	25	52	4	6	187	161	234	101	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	65	13	28	25	52	4	6	187	161	234	101	16
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.62	0.12	0.26	0.31	0.64	0.05	0.02	0.53	0.45	0.67	0.29	0.04
Final Sat.:	354	71	152	173	360	28	13	401	345	472	204	32
Capacity Analysis Module:												
Vol/Sat:	0.18	0.18	0.18	0.14	0.14	0.14	0.47	0.47	0.47	0.50	0.50	0.50
Crit Moves:	****				****		****			****		
Delay/Veh:	9.7	9.7	9.7	9.5	9.5	9.5	11.3	11.3	11.3	12.4	12.4	12.4
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.7	9.7	9.7	9.5	9.5	9.5	11.3	11.3	11.3	12.4	12.4	12.4
LOS by Move:	A	A	A	A	A	A	B	B	B	B	B	B
ApproachDel:		9.7			9.5			11.3			12.4	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.7			9.5			11.3			12.4	
LOS by Appr:		A			A			B			B	

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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #11 Hearst Avenue / Shattuck Avenue
*******************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.533
Loss Time (sec):      8 (Y+R =  6 sec) Average Delay (sec/veh):         8.3
Optimal Cycle:       52               Level Of Service:                 A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    22   22    22    22   22    22    22   22    22    22   22    22
Lanes:        1  0  1  1  0    1  0  1  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      19  291    43   199  810    57    31  278    24    11  225    51
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   19  291    43   199  810    57    31  278    24    11  225    51
Added Vol:      3    1   -13     3   11     0     0   38    25     7    4     0
Future:        11   99    22    55  176    22    33   33    33    11   22    77
Initial Fut:   33  391    52   257  997    79    64  349    82    29  251   128
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    33  391    52   257  997    79    64  349    82    29  251   128
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   33  391    52   257  997    79    64  349    82    29  251   128
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    33  391    52   257  997    79    64  349    82    29  251   128
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.26 0.93  0.93  0.49 0.94  0.94  0.78 0.78  0.78  0.81 0.81  0.81
Lanes:       1.00 1.77  0.23  1.00 1.85  0.15  0.26 1.41  0.33  0.14 1.23  0.63
Final Sat.:   500 3129   416   935 3308   262   385 2102   494   219 1898   968
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.12  0.12  0.27 0.30  0.30  0.17 0.17  0.17  0.13 0.13  0.13
Crit Moves:                        ****              ****
Green/Cycle: 0.54 0.54  0.54  0.54 0.54  0.54  0.34 0.34  0.34  0.34 0.34  0.34
Volume/Cap:  0.12 0.23  0.23  0.51 0.56  0.56  0.49 0.49  0.49  0.39 0.39  0.39
Delay/Veh:    2.6  2.0   2.0   5.8  3.4   3.4  18.8 18.8  18.8  17.5 17.5  17.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   2.6  2.0   2.0   5.8  3.4   3.4  18.8 18.8  18.8  17.5 17.5  17.5
DesignQueue:    1    7     1     4   18     1     2    9     2     1    6     3
*******************************************************************************
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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #12 Hearst Avenue / Oxford Avenue
*******************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.560
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        11.8
Optimal Cycle:       49               Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    19   19    19    19   19    19    22   22    22    22   22    22
Lanes:        1  0  1  1  0    0  1  0  1  0    0  1  0  1  0    1  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      46  328   374    48  841    38    10  399   114   207  281    27
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   46  328   374    48  841    38    10  399   114   207  281    27
Added Vol:      0   59    72     4   99     3    19   12    -1     9    9    19
Future:        22   55    44    11   33    22     0   88    33    33   77    11
Initial Fut:   68  442   490    63  973    63    29  499   146   249  367    57
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    68  442   490    63  973    63    29  499   146   249  367    57
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   68  442   490    63  973    63    29  499   146   249  367    57
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    68  442   490    63  973    63    29  499   146   249  367    57
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
Lanes:       1.00 1.00  1.00  0.11 1.78  0.11  0.09 1.48  0.43  1.11 1.64  0.25
Final Sat.:  1900 1805  1805   207 3196   207   155 2673   782  2003 2953   459
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.24  0.27  0.30 0.30  0.30  0.19 0.19  0.19  0.12 0.12  0.12
Crit Moves:                        ****              ****
Green/Cycle: 0.54 0.54  0.54  0.54 0.54  0.54  0.34 0.34  0.34  0.34 0.34  0.34
Volume/Cap:  0.07 0.45  0.50  0.57 0.57  0.57  0.55 0.55  0.55  0.37 0.37  0.37
Delay/Veh:    5.2  7.2   7.7   8.2  8.2   8.2  19.3 19.3  19.3  16.8 16.8  16.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   5.2  7.2   7.7   8.2  8.2   8.2  19.3 19.3  19.3  16.8 16.8  16.8
DesignQueue:    1    8     9     1   18     1     1   13     4     6    9     1
*******************************************************************************
```

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---------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*********************************************************************************
Intersection #13 Hearst Avenue / Spruce Street
*********************************************************************************
Average Delay (sec/veh):       0.8          Worst Case Level Of Service:        B
*********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:           Include          Include          Include           Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  1  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:        0    0    0     9    0    63    11  843    0     0  430     7
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0    0     9    0    63    11  843    0     0  430     7
Added Vol:       0    0    0     5    0     0     0   87    0     0   38     1
Future:          0    0    0     0    0    20     0  130    0     0  110     0
Initial Fut:     0    0    0    14    0    83    11 1060    0     0  578     8
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0    0    14    0    83    11 1060    0     0  578     8
Reduct Vol:      0    0    0     0    0     0     0    0    0     0    0     0
Final Vol.:      0    0    0    14    0    83    11 1060    0     0  578     8
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1134 xxxx   293   586 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   199 xxxx   709   999 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   198 xxxx   709   999 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.6 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  516 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 13.6 xxxxx   8.6 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            13.6            xxxxxx            xxxxxx
ApproachLOS:        *                B                *                 *
```



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---------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*********************************************************************************
Intersection #14 Hearst Avenue / Arch Street / Le Conte Avenue
*********************************************************************************
Average Delay (sec/veh):       3.0          Worst Case Level Of Service:        B
*********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:           Include          Include          Include           Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:        0    0    0     2    0   130   276  566    0     0  307     4
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0    0     2    0   130   276  566    0     0  307     4
Added Vol:       0    0    0     0    0     0    24   69    0     0   39     0
Future:          0    0    0     0    0    40    30  100    0     0   90     0
Initial Fut:     0    0    0     2    0   170   330  735    0     0  436     4
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0    0     2    0   170   330  735    0     0  436     4
Reduct Vol:      0    0    0     0    0     0     0    0    0     0    0     0
Final Vol.:      0    0    0     2    0   170   330  735    0     0  436     4
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1466 xxxx   220   440 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   121 xxxx   790  1131 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx    94 xxxx   790  1131 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.5 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  727 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            11.5            xxxxxx            xxxxxx
ApproachLOS:        *                B                *                 *
```

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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
******************************************************************************
Intersection #15 Hearst Avenue / Scenic Avenue
******************************************************************************
Average Delay (sec/veh):      0.5          Worst Case Level Of Service:      B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  0  0  1    0  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:        0    0     0     0    0    37     0  531     0     0  290    55
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0     0    0    37     0  531     0     0  290    55
Added Vol:       0    0     0     0    0     1     0    0     0     0   37     2
Future:          0    0     0     0    0    20     0  100     0     0   90    10
Initial Fut:     0    0     0     0    0    58     0  631     0     0  417    67
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0     0    0    58     0  631     0     0  417    67
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0     0    0    58     0  631     0     0  417    67
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx   242  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx   765  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx   765  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx  10.1 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     B     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx             10.1            xxxxxx           xxxxxx
ApproachLOS:        *                 B                *                *
```



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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #16 Hearst Avenue / Euclid Avenue
******************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        0.607
Loss Time (sec):      12 (Y+R =  3 sec) Average Delay (sec/veh):       18.5
Optimal Cycle:        53              Level Of Service:                B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:      0    0     0    25   25    25     5   16    16    16   16    16
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  0  1  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00-9:00 AM
Base Vol:        2    0     2    47    1   151    75  448     1     1  276    10
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     2    0     2    47    1   151    75  448     1     1  276    10
Added Vol:       0    0     0     3    0     3     0   69     0     0   45     0
Future:          0    0     0    11    0    55    11   99     0     0   77     0
Initial Fut:     2    0     2    61    1   209    86  616     1     1  398    10
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      2    0     2    61    1   209    86  616     1     1  398    10
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:     2    0     2    61    1   209    86  616     1     1  398    10
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:      2    0     2    61    1   209    86  616     1     1  398    10
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.87 1.00  0.87  0.84 0.84  0.84  0.63 1.00  1.00  1.00 1.00  1.00
Lanes:        0.50 0.00  0.50  0.22 0.01  0.77  1.00 0.99  0.01  0.01 0.97  0.02
Final Sat.:    825    0   825   358    6  1226  1201 1897     3     5 1843    46
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.00  0.00  0.17 0.17  0.17  0.07 0.32  0.32  0.22 0.22  0.22
Crit Moves:                         ****              ****
Green/Cycle: 0.38 0.00  0.38  0.38 0.38  0.38  0.43 0.43  0.43  0.43 0.43  0.43
Volume/Cap:  0.01 0.00  0.01  0.44 0.44  0.44  0.17 0.75  0.75  0.50 0.50  0.50
Delay/Veh:   12.4  0.0  12.4  17.2 17.2  17.2  12.0 22.0  22.0  15.6 15.6  15.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  12.4  0.0  12.4  17.2 17.2  17.2  12.0 22.0  22.0  15.6 15.6  15.6
DesignQueue:    0    0     0     1    0     5     2   14     0     0    9     0
******************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #17 Hearst Avenue / Le Roy Avenue
********************************************************************************
Average Delay (sec/veh):      1.6          Worst Case Level Of Service:        B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:        0    0     0    19    0    60    59  436     0     0  230     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0    19    0    60    59  436     0     0  230     3
Added Vol:       0    0     0     0    0     0     0   72     0     0   45     0
Future:          0    0     0     0    0    10    10   90     0     0   70     0
Initial Fut:     0    0     0    19    0    70    69  598     0     0  345     3
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0    19    0    70    69  598     0     0  345     3
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0    19    0    70    69  598     0     0  345     3
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   806 xxxx   347   348 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   255 xxxx   701  1222 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   244 xxxx   701  1222 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.1 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  500 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 13.7 xxxxx   8.1 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            13.7            xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #18 Hearst Avenue / Gayley Road / LaLoma Avenue
********************************************************************************
Cycle (sec):          65                Critical Vol./Cap. (X):        1.237
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        68.0
Optimal Cycle:       180                Level Of Service:                  E
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    17   17    17    17   17    17
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00-9:00 AM
Base Vol:      274  212    95    12  274    21    28  161   304    21   33     5
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   274  212    95    12  274    21    28  161   304    21   33     5
Added Vol:      33    3    42     0   38     0     0   43    29     2   12     0
Future:         77   11    22     0  132     0     0   88     0    22   22     0
Initial Fut:   384  226   159    12  444    21    28  292   333    45   67     5
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    384  226   159    12  444    21    28  292   333    45   67     5
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   384  226   159    12  444    21    28  292   333    45   67     5
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    384  226   159    12  444    21    28  292   333    45   67     5
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.57 0.57  0.57  0.98 0.98  0.98  0.92 0.92  0.92  0.76 0.76  0.85
Lanes:       0.50 0.29  0.21  0.03 0.93  0.04  0.04 0.45  0.51  0.40 0.60  1.00
Final Sat.:    540  318   224    47 1725    82    75  781   890   578  860  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.71 0.71  0.71  0.26 0.26  0.26  0.37 0.37  0.37  0.08 0.08  0.00
Crit Moves:       ****                                ****
Green/Cycle: 0.55 0.55  0.55  0.55 0.55  0.55  0.40 0.40  0.00  0.40 0.40  0.40
Volume/Cap:  1.28 1.28  1.28  0.46 0.46  0.46  0.94 0.94  xxxx  0.19 0.19  0.01
Delay/Veh:  154.3  154 154.3  10.2 10.2  10.2  38.1 38.1   0.0  12.1 12.1  10.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 154.3  154 154.3  10.2 10.2  10.2  38.1 38.1   0.0  12.1 12.1  10.5
DesignQueue:     7    4     3     0    8     0     1    7    13     1    1     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #19 Berkeley Way / Oxford Street
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.518
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       7.1
Optimal Cycle:       46              Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18   18   18    18   20   20    20   20   20    20
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      39  717    40   30 1132    11   20   18    72   10    2    12
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   39  717    40   30 1132    11   20   18    72   10    2    12
Added Vol:     38  128     0    0   81    26    3    0     4    0    0     0
PasserByVol:   10  110    10    0  100     0    0    0    20    0    0     0
Initial Fut:   87  955    50   30 1313    37   23   18    96   10    2    12
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    87  955    50   30 1313    37   23   18    96   10    2    12
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   87  955    50   30 1313    37   23   18    96   10    2    12
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    87  955    50   30 1313    37   23   18    96   10    2    12
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.17 0.94  0.94 0.27 0.95  0.95 0.87 0.87  0.87 0.85 0.87  0.87
Lanes:       1.00 1.90  0.10 1.00 1.95  0.05 0.17 0.13  0.70 1.00 0.14  0.86
Final Sat.:   314 3406   178  507 3497    99  277  217  1157 1621  236  1418
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.28 0.28  0.28 0.06 0.38  0.38 0.08 0.08  0.08 0.01 0.01  0.01
Crit Moves:                       ****             ****
Green/Cycle: 0.60 0.60  0.60 0.60 0.60  0.60 0.29 0.29  0.29 0.29 0.29  0.29
Volume/Cap:  0.46 0.47  0.47 0.10 0.63  0.63 0.29 0.29  0.29 0.02 0.03  0.03
Delay/Veh:   12.4  5.2   5.2  4.1  6.5   6.5 21.0 21.0  21.0 18.1 18.1  18.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  12.4  5.2   5.2  4.1  6.5   6.5 21.0 21.0  21.0 18.1 18.1  18.1
DesignQueue:    1   16     1    0   23     1    1    1     3    0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #20 University Avenue / Sixth Street
********************************************************************************
Cycle (sec):        114              Critical Vol./Cap. (X):        1.000
Loss Time (sec):     16 (Y+R =  5 sec) Average Delay (sec/veh):     100.8
Optimal Cycle:      180              Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit        Permitted        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     6   23    23    0   23    23    6   15    15    6   15    15
Lanes:        1  0  1  0  1   1  0  1  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     211  111    19   73  290   325   89  932   333   40  931    21
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  211  111    19   73  290   325   89  932   333   40  931    21
Added Vol:      0   17    12    0    4     1    6  296     0    1   32     0
Future:       150   60    10   10   10    80   10   60    40   10  150    10
Initial Fut:  361  188    41   83  304   406  105 1288   373   51 1113    31
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   361  188    41   83  304   406  105 1288   373   51 1113    31
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  361  188    41   83  304   406  105 1288   373   51 1113    31
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   361  188    41   83  304   406  105 1288   373   51 1113    31
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.98 1.00  0.85 1.00 1.00  0.85 0.95 0.92  0.92 0.95 0.95  0.95
Lanes:       1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.55  0.45 1.00 1.95  0.05
Final Sat.:  1858 1900  1615 1900 1900  1615 1805 2704   783 1805 3498    97
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.10  0.03 0.04 0.16  0.25 0.06 0.48  0.48 0.03 0.32  0.32
Crit Moves:  ****                       ****       ****       ****
Green/Cycle: 0.44 0.44  0.44 0.25 0.25  0.25 0.06 0.37  0.37 0.05 0.35  0.35
Volume/Cap:  0.44 0.22  0.06 0.18 0.65  1.02 0.90 1.30  1.30 0.54 0.90  0.90
Delay/Veh:   47.8 20.4  18.5 34.8 45.6  94.7 112.1  177 176.8 72.7 45.0  45.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  47.8 20.4  18.5 34.8 45.6  94.7 112.1  177 176.8 72.7 45.0  45.0
DesignQueue:   19    7     1    4   15    21    6   58    17    3   49     1
********************************************************************************
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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #21 University Avenue / San Pablo Avenue
******************************************************************************
Cycle (sec):        114              Critical Vol./Cap. (X):        0.966
Loss Time (sec):     16 (Y+R =  5 sec) Average Delay (sec/veh):      130.9
Optimal Cycle:      167              Level Of Service:                 F
******************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    5   21    21    5   21    21    5   22    22    5   22    22
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:    100  457    75  190  837    83   56  957    49   63  644    93
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 100  457    75  190  837    83   56  957    49   63  644    93
Added Vol:     0    3     7   78   50     0    0  308     1    1   32    10
Future:       50  200    40   60   30    20   10   60    10   10  120   100
Initial Fut: 150  660   122  328  917   103   66 1325    60   74  796   203
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  150  660   122  328  917   103   66 1325    60   74  796   203
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 150  660   122  328  917   103   66 1325    60   74  796   203
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  150  660   122  328  917   103   66 1325    60   74  796   203
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.95 0.93  0.93 0.95 0.94  0.94 0.95 0.94  0.94 0.95 0.92  0.92
Lanes:      1.00 1.69  0.31 1.00 1.80  0.20 1.00 1.91  0.09 1.00 1.59  0.41
Final Sat.: 1805 2977   550 1805 3197   359 1805 3433   155 1805 2790   712
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.08 0.22  0.22 0.18 0.29  0.29 0.04 0.39  0.39 0.04 0.29  0.29
Crit Moves:      ****       ****                  ****      ****
Green/Cycle: 0.13 0.28  0.28 0.29 0.44  0.44 0.04 0.25  0.25 0.04 0.25  0.25
Volume/Cap: 0.65 0.79  0.79 0.64 0.65  0.65 0.83 1.54  1.54 0.93 1.14  1.14
Delay/Veh:  61.0 44.5  44.5 41.4 27.3  27.3 116.3  293 293.1 138.5  120 119.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 61.0 44.5  44.5 41.4 27.3  27.3 116.3  293 293.1 138.5  120 119.9
DesignQueue:   8   32     6   16   35     4    4   70     3    5   41    10
******************************************************************************
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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #22 University Avenue / Martin Luther King Way
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        1.021
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       41.0
Optimal Cycle:      180              Level Of Service:                 D
******************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Prot+Permit       Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    5   23    23   23   23    23   17   17    17   17   17    17
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:    178  568    80   57  833    87   81  703   185   41  477    47
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 178  568    80   57  833    87   81  703   185   41  477    47
Added Vol:     1    3     3    0   14     0    2  396    -2    0   41     0
Future:       70    0     0    0  230    30   10  130    20   20  160    80
Initial Fut: 249  571    83   57 1077   117   93 1229   203   61  678   127
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  249  571    83   57 1077   117   93 1229   203   61  678   127
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 249  571    83   57 1077   117   93 1229   203   61  678   127
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  249  571    83   57 1077   117   93 1229   203   61  678   127
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.99 0.93  0.93 1.00 0.94  0.94 0.17 0.93  0.93 1.00 0.93  0.93
Lanes:      1.00 1.75  0.25 1.00 1.80  0.20 1.00 1.72  0.28 1.00 1.68  0.32
Final Sat.: 1880 3092   449 1900 3207   348  315 3033   501 1900 2968   556
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.13 0.18  0.18 0.03 0.34  0.34 0.29 0.41  0.41 0.03 0.23  0.23
Crit Moves: ****                 ****            ****
Green/Cycle: 0.45 0.45  0.45 0.35 0.35  0.35 0.37 0.37  0.37 0.37 0.37  0.37
Volume/Cap: 0.30 0.41  0.41 0.08 0.95  0.95 0.80 1.10  1.10 0.09 0.62  0.62
Delay/Veh:  26.1 11.1  11.1 13.4 35.0  35.0 59.9 75.6  75.6 13.6 18.9  18.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 26.1 11.1  11.1 13.4 35.0  35.0 59.9 75.6  75.6 13.6 18.9  18.9
DesignQueue:   8   12     2    1   27     3    2   31     5    1   16     3
******************************************************************************
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365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #23 University Avenue / Milvia Street

Cycle (sec): 65 Critical Vol./Cap. (X): 0.678
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 14.2
Optimal Cycle: 49 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	21	21	21	21	21	21	20	20	20	20	20	20
Lanes:		1 0 0 1 0			0 0 1! 0 0			0 1 0 1 0			0 1 0 1 0	
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	100	98	21	6	203	63	37	656	137	18	406	15
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	100	98	21	6	203	63	37	656	137	18	406	15
Added Vol:	0	0	0	0	0	0	0	399	0	0	41	0
Future:	10	10	10	10	10	10	20	80	20	20	240	20
Initial Fut:	110	108	31	16	213	73	57	1135	157	38	687	35
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	110	108	31	16	213	73	57	1135	157	38	687	35
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	110	108	31	16	213	73	57	1135	157	38	687	35
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	110	108	31	16	213	73	57	1135	157	38	687	35
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.73	0.97	0.97	0.95	0.95	0.95	0.83	0.83	0.83	0.79	0.79	0.79
Lanes:	1.00	0.78	0.22	0.05	0.71	0.24	0.08	1.69	0.23	0.10	1.81	0.09
Final Sat.:	1391	1428	410	96	1276	437	133	2654	367	150	2719	139
Capacity Analysis Module:												
Vol/Sat:	0.08	0.08	0.08	0.17	0.17	0.17	0.43	0.43	0.43	0.25	0.25	0.25
Crit Moves:					****			****				
Green/Cycle:	0.32	0.32	0.32	0.32	0.32	0.32	0.55	0.55	0.55	0.55	0.55	0.55
Volume/Cap:	0.24	0.23	0.23	0.52	0.52	0.52	0.77	0.77	0.77	0.46	0.46	0.46
Delay/Veh:	17.5	17.0	17.0	21.1	21.1	21.1	14.7	14.7	14.7	9.6	9.6	9.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	17.5	17.0	17.0	21.1	21.1	21.1	14.7	14.7	14.7	9.6	9.6	9.6
DesignQueue:	3	3	1	0	5	2	1	20	3	1	12	1

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #24 University Avenue / SB Shattuck Avenue

Cycle (sec): 75 Critical Vol./Cap. (X): 0.679
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 39.5
Optimal Cycle: 44 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	16	16	16	16	16	16	16	16	16
Lanes:		0 0 0 0 0			0 1 1 1 0			1 0 1 1 0			0 1 0 1 1	
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	0	0	0	49	767	105	115	401	162	26	356	314
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	49	767	105	115	401	162	26	356	314
Added Vol:	0	0	0	0	16	6	55	220	124	0	36	36
Future:	0	0	0	11	132	66	22	55	11	11	220	99
Initial Fut:	0	0	0	60	915	177	192	676	297	37	612	449
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	60	915	177	192	676	297	37	612	449
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	60	915	177	192	676	297	37	612	449
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	60	915	177	192	676	297	37	612	449
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.78	0.78	0.78	0.29	0.82	0.82	0.70	0.70	0.70
Lanes:	0.00	0.00	0.00	0.16	2.38	0.46	1.00	1.39	0.61	0.10	1.67	1.23
Final Sat.:	0	0	0	232	3539	685	552	2153	946	134	2222	1630
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.26	0.26	0.26	0.35	0.31	0.31	0.28	0.28	0.28
Crit Moves:					****		****					
Green/Cycle:	0.00	0.00	0.00	0.36	0.36	0.36	0.30	0.30	0.30	0.00	0.53	0.53
Volume/Cap:	0.00	0.00	0.00	0.72	0.72	0.72	1.16	1.05	1.05	xxxx	0.52	0.52
Delay/Veh:	0.0	0.0	0.0	23.5	23.5	23.5	145.3	68.6	68.6	0.0	12.4	12.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	23.5	23.5	23.5	145.3	68.6	68.6	0.0	12.4	12.4
DesignQueue:	0	0	0	2	26	5	6	21	9	2	13	9

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-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #25 University Avenue / NB Shattuck Avenue
*****************************************************************************
Cycle (sec):        75               Critical Vol./Cap. (X):        0.475
Loss Time (sec):    15 (Y+R =  4 sec) Average Delay (sec/veh):       17.0
Optimal Cycle:      47               Level Of Service:                 B
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:   19    0    19    0    0     0    0   13     0    0   13     0
Lanes:        2  0  1! 0  1   0  0  0  0  0   0  0  2  0  0   0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     458    0   168    0    0     0    0  444     0    0  235     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  458    0   168    0    0     0    0  444     0    0  235     0
Added Vol:     53    0    33    0    0     0    0  220     0    0   19     0
Future:       220    0    20    0    0     0    0    0     0    0   80     0
Initial Fut:  731    0   221    0    0     0    0  664     0    0  334     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   731    0   221    0    0     0    0  664     0    0  334     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  731    0   221    0    0     0    0  664     0    0  334     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   731    0   221    0    0     0    0  664     0    0  334     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.81 1.00  0.84 1.00 1.00  1.00 1.00 0.86  1.00 1.00 0.86  1.00
Lanes:       2.69 0.00  1.31 0.00 0.00  0.00 0.00 2.00  0.00 0.00 2.00  0.00
Final Sat.:  4153    0  2075    0    0     0    0 3249     0    0 3249     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.00  0.11 0.00 0.00  0.00 0.00 0.20  0.00 0.00 0.10  0.00
Crit Moves:  ****                                 ****       ****
Green/Cycle: 0.37 0.00  0.37 0.00 0.00  0.00 0.00 0.43  0.00 0.00 0.43  0.00
Volume/Cap:  0.48 0.00  0.29 0.00 0.00  0.00 0.00 0.48  0.00 0.00 0.24  0.00
Delay/Veh:   18.9  0.0  16.9  0.0  0.0   0.0  0.0 16.5   0.0  0.0 14.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  18.9  0.0  16.9  0.0  0.0   0.0  0.0 16.5   0.0  0.0 14.0   0.0
DesignQueue:   20    0     6    0    0     0    0   17     0    0    8     0
*****************************************************************************
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-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #26 University Avenue / Oxford Street
*****************************************************************************
Cycle (sec):        65               Critical Vol./Cap. (X):        0.932
Loss Time (sec):    12 (Y+R =  4 sec) Average Delay (sec/veh):       40.2
Optimal Cycle:     133               Level Of Service:                 D
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    5   18    18    5   18    18   18   18    18   18   18    18
Lanes:        1  0  1  1  0   1  0  1  1  0   1  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     147  487     4   41 1101    77  300   38   217    6   12    23
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  147  487     4   41 1101    77  300   38   217    6   12    23
Added Vol:     10   54    -2   -3   79     9  113   -6   147    0   -1     0
Future:        55   99     0   11   88    33   22   11    22    0   11    11
Initial Fut:  212  640     2   49 1268   119  435   43   386    6   22    34
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   212  640     2   49 1268   119  435   43   386    6   22    34
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  212  640     2   49 1268   119  435   43   386    6   22    34
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   212  640     2   49 1268   119  435   43   386    6   22    34
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.86 0.86  0.86 0.32 0.84  0.84 0.64 0.64  0.77 0.82 0.82  0.82
Lanes:       1.00 1.99  0.01 1.00 1.83  0.17 1.82 0.18  1.00 0.10 0.35  0.55
Final Sat.:  1625 3239    10  599 2932   275 2213  219  1454  150  552   853
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.20  0.20 0.08 0.43  0.43 0.20 0.20  0.27 0.04 0.04  0.04
Crit Moves:  ****                 ****                  ****
Green/Cycle: 0.41 0.41  0.41 0.41 0.41  0.41 0.30 0.30  0.30 0.30 0.30  0.30
Volume/Cap:  0.32 0.48  0.48 0.20 1.06  1.06 0.66 0.66  0.89 0.13 0.13  0.13
Delay/Veh:   14.4 15.5  15.5 14.3 62.0  62.0 24.4 24.4  43.9 17.2 17.2  17.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  14.4 15.5  15.5 14.3 62.0  62.0 24.4 24.4  43.9 17.2 17.2  17.2
DesignQueue:    5   14     0    1   30     3   11    1    10    0    1     1
*****************************************************************************
```

```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #27 Univeristy Drive (East Gate)  / Gayley Road
********************************************************************************
Average Delay (sec/veh):      3.8         Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0   0  0  0  1  0   1  0  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:      69  476     0     0  543    75    53    0    73     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   69  476     0     0  543    75    53    0    73     0    0     0
Added Vol:    -13   80     0     0   91   -21    -2    0    -1     0    0     0
Future:        20   70     0     0  110    10    10    0    20     0    0     0
Initial Fut:   76  626     0     0  744    64    61    0    92     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    76  626     0     0  744    64    61    0    92     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    76  626     0     0  744    64    61    0    92     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  808 xxxx xxxxx  xxxx xxxx xxxxx  1554 xxxx   776  xxxx xxxx xxxxx
Potent Cap.:  826 xxxx xxxxx  xxxx xxxx xxxxx   126 xxxx   401  xxxx xxxx xxxxx
Move Cap.:    826 xxxx xxxxx  xxxx xxxx xxxxx   117 xxxx   401  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.8 xxxx xxxxx xxxxx xxxx xxxxx  65.2 xxxx  16.6 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     F    *     C     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             36.0           xxxxxx
ApproachLOS:        *                *                 E               *
```



```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #28 Addison Street / Oxford Street
********************************************************************************
Average Delay (sec/veh):      1.3         Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      54  647     0     0 1165    61     4    0    31     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   54  647     0     0 1165    61     4    0    31     0    0     0
Added Vol:     20   60     0     0  207    18     2    0     2     0    0     0
PasserByVol:   20  140     0     0   90    10     0    0    10     0    0     0
Initial Fut:   94  847     0     0 1462    89     6    0    43     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:   103  931     0     0 1607    98     7    0    47     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   103  931     0     0 1607    98     7    0    47     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1281 xxxx xxxxx  xxxx xxxx xxxxx  2105 xxxx   135  xxxx xxxx xxxxx
Potent Cap.:  408 xxxx xxxxx  xxxx xxxx xxxxx    34 xxxx   666  xxxx xxxx xxxxx
Move Cap.:    408 xxxx xxxxx  xxxx xxxx xxxxx    27 xxxx   666  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 16.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    C    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  172 xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 35.3 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    E     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             35.3           xxxxxx
ApproachLOS:        *                *                 E               *
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #29 Center Street / SB Shattuck Avenue

Cycle (sec):	65	Critical Vol./Cap. (X):	0.449
Loss Time (sec):	12 (Y+R = 9 sec)	Average Delay (sec/veh):	16.9
Optimal Cycle:	65	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	20	20	20	0	22	22	33	33	0
Lanes:	0 0	0	0 0	0 1	1	1 0	0 0	0	1 0	0 1	0	0 0
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	0	0	0	15	779	71	0	69	51	17	102	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	15	779	71	0	69	51	17	102	0
Added Vol:	0	0	0	0	85	0	0	2	0	0	0	0
Future:	0	0	0	0	130	20	0	50	30	30	40	0
Initial Fut:	0	0	0	15	994	91	0	121	81	47	142	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	15	994	91	0	121	81	47	142	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	15	994	91	0	121	81	47	142	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	15	994	91	0	121	81	47	142	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.80	0.80	0.80	1.00	0.85	0.85	0.80	0.80	1.00
Lanes:	0.00	0.00	0.00	0.04	2.71	0.25	0.00	0.60	0.40	0.25	0.75	0.00
Final Sat.:	0	0	0	62	4118	377	0	969	649	377	1138	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.24	0.24	0.24	0.00	0.12	0.12	0.12	0.12	0.00
Crit Moves:					****			****				
Green/Cycle:	0.00	0.00	0.00	0.31	0.31	0.31	0.00	0.34	0.34	0.51	0.51	0.00
Volume/Cap:	0.00	0.00	0.00	0.78	0.78	0.78	0.00	0.37	0.37	0.25	0.25	0.00
Delay/Veh:	0.0	0.0	0.0	18.9	18.9	18.9	0.0	18.2	18.2	3.6	3.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	18.9	18.9	18.9	0.0	18.2	18.2	3.6	3.6	0.0
DesignQueue:	0	0	0	0	26	2	0	3	2	1	3	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #30 Center Street / NB Shattuck Avenue

Cycle (sec):	65	Critical Vol./Cap. (X):	0.397
Loss Time (sec):	8 (Y+R = 9 sec)	Average Delay (sec/veh):	5.3
Optimal Cycle:	60	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Permitted			Permitted	
Rights:		Include			Include			Include			Include	
Min. Green:	30	30	30	0	0	0	22	22	0	0	22	22
Lanes:	0 1	1	1 0	0 0	0	0 0	0 1	0	0 0	0 0	0	1 0
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	42	616	51	0	0	0	26	56	0	0	77	26
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	42	616	51	0	0	0	26	56	0	0	77	26
Added Vol:	0	102	-2	0	0	0	0	2	0	0	0	0
Future:	30	200	60	0	0	0	10	40	0	0	40	30
Initial Fut:	72	918	109	0	0	0	36	98	0	0	117	56
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	72	918	109	0	0	0	36	98	0	0	117	56
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	72	918	109	0	0	0	36	98	0	0	117	56
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	72	918	109	0	0	0	36	98	0	0	117	56
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.79	0.79	0.79	1.00	1.00	1.00	0.79	0.79	1.00	1.00	0.86	0.86
Lanes:	0.20	2.50	0.30	0.00	0.00	0.00	0.27	0.73	0.00	0.00	0.68	0.32
Final Sat.:	297	3783	449	0	0	0	405	1103	0	0	1106	529
Capacity Analysis Module:												
Vol/Sat:	0.24	0.24	0.24	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.11	0.11
Crit Moves:		****									****	
Green/Cycle:	0.54	0.54	0.54	0.00	0.00	0.00	0.34	0.34	0.00	0.00	0.34	0.34
Volume/Cap:	0.45	0.45	0.45	0.00	0.00	0.00	0.26	0.26	0.00	0.00	0.31	0.31
Delay/Veh:	2.6	2.6	2.6	0.0	0.0	0.0	11.5	11.5	0.0	0.0	17.4	17.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	2.6	2.6	2.6	0.0	0.0	0.0	11.5	11.5	0.0	0.0	17.4	17.4
DesignQueue:	1	16	2	0	0	0	1	2	0	0	3	1

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-----------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               AM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #31 Center Street / Oxford Street
*****************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.674
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      13.3
Optimal Cycle:       46              Level Of Service:                 B
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   19   19    19   19   19    19   19   19    19   19   19    19
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     50  663    42   11 1145    39   26   10    43   19    6     8
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  50  663    42   11 1145    39   26   10    43   19    6     8
Added Vol:     0   77    -2   -5  214     0    4   -4     0    0    0     0
Future:       30   90    10    0   70    30   60    0    30    0    0     0
Initial Fut:  80  830    50    6 1429    69   90    6    73   19    6     8
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   80  830    50    6 1429    69   90    6    73   19    6     8
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  80  830    50    6 1429    69   90    6    73   19    6     8
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   80  830    50    6 1429    69   90    6    73   19    6     8
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.11 0.85  0.85 0.28 0.85  0.85 0.70 0.70  0.70 0.74 0.74  0.74
Lanes:       1.00 1.89  0.11 1.00 1.91  0.09 0.53 0.04  0.43 0.58 0.18  0.24
Final Sat.:   210 3037   183  525 3078   149  709   47   575  804  254   339
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.38 0.27  0.27 0.01 0.46  0.46 0.13 0.13  0.13 0.02 0.02  0.02
Crit Moves:                       ****              ****
Green/Cycle: 0.58 0.58  0.58 0.58 0.58  0.58 0.29 0.29  0.29 0.29 0.29  0.29
Volume/Cap:  0.65 0.47  0.47 0.02 0.79  0.79 0.43 0.43  0.43 0.08 0.08  0.08
Delay/Veh:   32.7  8.6   8.6  5.8 14.0  14.0 22.2 22.2  22.2 17.1 17.1  17.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  32.7  8.6   8.6  5.8 14.0  14.0 22.2 22.2  22.2 17.1 17.1  17.1
DesignQueue:    1   13     1    0   24     1    2    0     2    0    0     0
*****************************************************************************
```



```
-----------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               AM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM 4-Way Stop Method (Future Volume Alternative)
*****************************************************************************
Intersection #32 Stadium Rim Road / Gayley Road
*****************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        1.262
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):      89.2
Optimal Cycle:        0              Level Of Service:                 F
*****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  386    19  128  471     0   12    5    14   18    1   118
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  386    19  128  471     0   12    5    14   18    1   118
Added Vol:     0   60    23   25   64     0    0    0     0   25    0     8
Future:        0   66    11   22  110     0    0    0     0   11    0    22
Initial Fut:   0  512    53  175  645     0   12    5    14   54    1   148
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  512    53  175  645     0   12    5    14   54    1   148
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  512    53  175  645     0   12    5    14   54    1   148
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  512    53  175  645     0   12    5    14   54    1   148
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.91  0.09 0.21 0.79  0.00 0.39 0.16  0.45 0.26 0.01  0.73
Final Sat.:     0  585    61  139  511     0  179   75   209  144    3   395
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.88  0.88 1.26 1.26  xxxx 0.07 0.07  0.07 0.37 0.37  0.37
Crit Moves:       ****            ****       ****                  ****
Delay/Veh:    0.0 34.7  34.7 148.5  148   0.0 10.8 10.8  10.8 13.1 13.1  13.1
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 34.7  34.7 148.5  148   0.0 10.8 10.8  10.8 13.1 13.1  13.1
LOS by Move:   *    D     D    F    F     *    B    B     B    B    B     B
ApproachDel:      34.7            148.5            10.8             13.1
Delay Adj:        1.00             1.00            1.00             1.00
ApprAdjDel:       34.7            148.5            10.8             13.1
LOS by Appr:        D                F               B                B
*****************************************************************************
```

```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #33 Allston Way / Oxford Street
********************************************************************************
Average Delay (sec/veh):      1.9          Worst Case Level Of Service:       E
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  1  0  0    0  1  0  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      17  798     0    59 1111    34    16    0    33     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   17  798     0    59 1111    34    16    0    33     0    0     0
Added Vol:      0   75     0     0  214     0     0    0     0     0    0     0
Future:        10  130     0    10   80    10     0    0    30     0    0     0
Initial Fut:   27 1003     0    69 1405    44    16    0    63     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:    29 1078     0    74 1511    47    17    0    68     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    29 1078     0    74 1511    47    17    0    68     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1050 xxxx xxxxx  1078 xxxx xxxxx  2042 xxxx    10  xxxx xxxx xxxxx
Potent Cap.:  503 xxxx xxxxx   654 xxxx xxxxx    37 xxxx   805  xxxx xxxx xxxxx
Move Cap.:    503 xxxx xxxxx   654 xxxx xxxxx    32 xxxx   805  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 12.6 xxxx xxxxx  11.2 xxxx xxxxx 204.1 xxxx   9.9 xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     F    *     A     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 12.6 xxxx xxxxx  11.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             49.2           xxxxxx
ApproachLOS:        *                *                E                *
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #34 Kittridge Street / Oxford Street / Fulton Street
********************************************************************************
Average Delay (sec/veh): OVERFLOW          Worst Case Level Of Service:       F
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  1  0    0  1  0  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      13  801     0     0 1122    18     6    0    23     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   13  801     0     0 1122    18     6    0    23     0    0     0
Added Vol:      0   68    23    69  145     0     0   27     0     2    3     7
Future:         0  120     0     0   70    30    10    0    10     0    0     0
Initial Fut:   13  989    23    69 1337    48    16   27    33     2    3     7
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    13  989    23    69 1337    48    16   27    33     2    3     7
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    13  989    23    69 1337    48    16   27    33     2    3     7
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.5  6.5   6.9   7.5  6.5   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  513 xxxx xxxxx  1012 xxxx xxxxx  1521 2303     0  1257 2322   506
Potent Cap.:  701 xxxx xxxxx   693 xxxx xxxxx    55   26     0    86   25   517
Move Cap.:    701 xxxx xxxxx   693 xxxx xxxxx    44   23     0     0   22   517
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 10.2 xxxx xxxxx  10.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   49 xxxxx  xxxx    0 xxxxx
Shrd StpDel: 10.2 xxxx xxxxx  10.8 xxxx xxxxx xxxxx  466 xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    F     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx            466.0           xxxxxx
ApproachLOS:        *                *                F                F
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #35 Stadium Rim Road / Centennial Drive
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.351
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):        9.8
Optimal Cycle:        0              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  0  0  0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0   70   160    94   22    0     0    0    0   114    0    71
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0   70   160    94   22    0     0    0    0   114    0    71
Added Vol:     0    0     0    48    0    0     0    0    0     0    0    33
Future:        0   22    22    22   11    0     0    0    0    22    0    11
Initial Fut:   0   92   182   164   33    0     0    0    0   136    0   115
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0   92   182   164   33    0     0    0    0   136    0   115
Reduct Vol:    0    0     0     0    0    0     0    0    0     0    0     0
Reduced Vol:   0   92   182   164   33    0     0    0    0   136    0   115
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0   92   182   164   33    0     0    0    0   136    0   115
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 0.34  0.66  0.83 0.17  0.00  0.00 0.00  0.00  0.54 0.00  0.46
Final Sat.:    0  266   526   577  116    0     0    0    0   387    0   327
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.35  0.35  0.28 0.28  xxxx  xxxx xxxx  xxxx  0.35 xxxx  0.35
Crit Moves:             ****       ****                         ****
Delay/Veh:    0.0  9.5   9.5   9.8  9.8   0.0   0.0  0.0   0.0  10.1  0.0  10.1
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  9.5   9.5   9.8  9.8   0.0   0.0  0.0   0.0  10.1  0.0  10.1
LOS by Move:   *    A     A     A    A     *     *    *     *     B    *     B
ApproachDel:       9.5              9.8            xxxxxx            10.1
Delay Adj:        1.00             1.00             xxxxx            1.00
ApprAdjDel:        9.5              9.8            xxxxxx            10.1
LOS by Appr:        A                A                *                B
********************************************************************************
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #36 Bancroft Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.619
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       10.6
Optimal Cycle:       42              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    0     0   18   18     0    0    0    16   16    16
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     29  912     0     0  788   12     1    0   62   116   51    71
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  29  912     0     0  788   12     1    0   62   116   51    71
Added Vol:     0  118     0     0   87    0     0    0    0    12    0     9
Future:       11  308     0     0  209   11     0    0    0    33   11    11
Initial Fut:  40 1338     0     0 1084   23     1    0   62   161   62    91
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   40 1338     0     0 1084   23     1    0   62   161   62    91
Reduct Vol:    0    0     0     0    0    0     0    0    0     0    0     0
Reduced Vol:  40 1338     0     0 1084   23     1    0   62   161   62    91
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   40 1338     0     0 1084   23     1    0   62   161   62    91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.23 0.86  1.00  1.00 0.85  0.85  0.78 1.00  0.78  0.65 0.82  0.82
Lanes:       1.00 2.00  0.00  0.00 1.96  0.04  0.02 0.00  0.98  1.00 0.41  0.59
Final Sat.:   441 3249     0     0 3172   67    23    0  1453  1228  631   927
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.41  0.00  0.00 0.34  0.34  0.04 0.00  0.04  0.13 0.10  0.10
Crit Moves:       ****                                          ****
Green/Cycle: 0.63 0.63  0.00  0.00 0.63  0.63  0.25 0.00  0.25  0.25 0.25  0.25
Volume/Cap:  0.14 0.65  0.00  0.00 0.54  0.54  0.17 0.00  0.17  0.53 0.40  0.40
Delay/Veh:    6.0  9.2   0.0   0.0  7.8   7.8  20.3  0.0  20.3  27.8 23.6  23.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   6.0  9.2   0.0   0.0  7.8   7.8  20.3  0.0  20.3  27.8 23.6  23.6
DesignQueue:    1   20     0     0   16     0     0    0     2     4    2     3
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #37 Bancroft Way / Fulton Street

Cycle (sec): 65 Critical Vol./Cap. (X): 0.421
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 9.7
Optimal Cycle: 49 Level Of Service: A

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Permitted	Permitted	Permitted	Permitted
Rights:	Include	Include	Include	Ignore
Lanes:	0 1 1 0 0	0 0 2 1 0	0 0 0 0 0	0 1 1 0 1

Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	17	17	0	0	17	17	0	0	0	24	24	24
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	13	146	0	0	1071	79	0	0	0	84	173	650
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	13	146	0	0	1071	79	0	0	0	84	173	650
Added Vol:	13	0	0	0	127	20	0	0	0	2	24	91
Future:	10	10	0	0	60	10	0	0	0	10	20	110
Initial Fut:	36	156	0	0	1258	109	0	0	0	96	217	851
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	36	156	0	0	1258	109	0	0	0	96	217	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	36	156	0	0	1258	109	0	0	0	96	217	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Final Vol.:	36	156	0	0	1258	109	0	0	0	96	217	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.71	0.71	1.00	1.00	0.90	0.90	1.00	1.00	1.00	0.81	0.81	1.00
Lanes:	0.37	1.63	0.00	0.00	2.76	0.24	0.00	0.00	0.00	0.61	1.39	1.00
Final Sat.:	506	2194	0	0	4716	409	0	0	0	941	2127	1900
Capacity Analysis Module:												
Vol/Sat:	0.07	0.07	0.00	0.00	0.27	0.27	0.00	0.00	0.00	0.10	0.10	0.00
Crit Moves:					****						****	
Green/Cycle:	0.51	0.51	0.00	0.00	0.51	0.51	0.00	0.00	0.00	0.37	0.37	0.00
Volume/Cap:	0.14	0.14	0.00	0.00	0.53	0.53	0.00	0.00	0.00	0.28	0.28	0.00
Delay/Veh:	6.6	6.6	0.0	0.0	8.9	8.9	0.0	0.0	0.0	15.0	15.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.6	6.6	0.0	0.0	8.9	8.9	0.0	0.0	0.0	15.0	15.0	0.0
DesignQueue:	1	3	0	0	24	2	0	0	0	2	5	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
AM Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #38 Bancroft Way / Ellsworth Street

Average Delay (sec/veh): 6.4 Worst Case Level Of Service: C

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	1 1 0 0 0	0 0 0 0 1	0 0 0 0 0	0 0 1 1 0

Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM												
Base Vol:	241	60	0	0	0	11	0	0	0	0	674	39
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	241	60	0	0	0	11	0	0	0	0	674	39
Added Vol:	96	0	0	0	0	0	0	0	0	0	128	0
Future:	10	0	0	0	0	0	0	0	0	0	130	0
Initial Fut:	347	60	0	0	0	11	0	0	0	0	932	39
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	347	60	0	0	0	11	0	0	0	0	932	39
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Final Vol.:	347	60	0	0	0	11	0	0	0	0	932	39
Critical Gap Module:												
Critical Gp:	7.1	6.5	xxxxx	xxxxx	xxxx	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	xxxxx	xxxxx	xxxx	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	466	971	xxxxx	xxxx	xxxx	486	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	510	255	xxxxx	xxxx	xxxx	586	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	501	255	xxxxx	xxxx	xxxx	586	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Level Of Service Module:												
Stopped Del:	16.0	xxxx	xxxxx	xxxxx	xxxx	11.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	C	*	*	*	*	B	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	401	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Shrd StpDel:	25.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	D	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		21.6			11.3			xxxxxx			xxxxxx	
ApproachLOS:		C			B			*			*	

```
------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
******************************************************************************
Intersection #39 Bancroft Way / Dana Street
******************************************************************************
Average Delay (sec/veh):      0.0          Worst Case Level Of Service:       A
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  1  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:        0    0     0     0    0     0     0    0     0   145  721     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0     0    0     0     0    0     0   145  721     0
Added Vol:       0    0     0     0    0     0     0    0     0     4  128     0
Future:          0    0     0     0    0     0     0    0     0    50  130     0
Initial Fut:     0    0     0     0    0     0     0    0     0   199  979     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0     0    0     0     0    0     0   199  979     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0     0    0     0     0    0     0   199  979     0
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        *                *                *                *
```



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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #40 Bancroft Way / Telegraph Avenue
******************************************************************************
Cycle (sec):          65                Critical Vol./Cap. (X):         0.328
Loss Time (sec):       8 (Y+R = 23 sec) Average Delay (sec/veh):         21.6
Optimal Cycle:        46                Level Of Service:                   C
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     15    0     0     0    0     0     0    0     0     0   23     0
Lanes:        2  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      427    0     0     0    0     0     0    0     0     0  460     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   427    0     0     0    0     0     0    0     0     0  460     0
Added Vol:      24    0     0     0    0     0     0    0     0     0  144     0
Future:        100    0     0     0    0     0     0    0     0     0   70     0
Initial Fut:   551    0     0     0    0     0     0    0     0     0  674     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    551    0     0     0    0     0     0    0     0     0  674     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   551    0     0     0    0     0     0    0     0     0  674     0
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    551    0     0     0    0     0     0    0     0     0  674     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.92 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.91  1.00
Lanes:        2.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 3.00  0.00
Final Sat.:   3502    0     0     0    0     0     0    0     0     0 5187     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.16 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.13  0.00
Crit Moves:   ****                                                   ****
Green/Cycle:  0.23 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.35  0.00
Volume/Cap:   0.68 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.37  0.00
Delay/Veh:    28.2  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 16.2   0.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   28.2  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 16.2   0.0
DesignQueue:    16    0     0     0    0     0     0    0     0     0   16     0
******************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #41 Bancroft Way / Bowditch Street
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.597
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       14.1
Optimal Cycle:        0              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     191    0    0    0    0    0    0    0    0   99  494    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  191    0    0    0    0    0    0    0    0   99  494    0
Added Vol:      0    0    0    0    0    0    0    0    0    3  144    0
Future:        10    0    0    0    0    0    0    0    0   20   60    0
Initial Fut:  201    0    0    0    0    0    0    0    0  122  698    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   201    0    0    0    0    0    0    0    0  122  698    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  201    0    0    0    0    0    0    0    0  122  698    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   201    0    0    0    0    0    0    0    0  122  698    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.30 1.70 0.00
Final Sat.:   625    0    0    0    0    0    0    0    0  204 1189    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.32 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.60 0.59 xxxx
Crit Moves:  ****                                         ****
Delay/Veh:   11.1  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 15.2 14.7  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  11.1  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 15.2 14.7  0.0
LOS by Move:    B    *    *    *    *    *    *    *    *    C    B    *
ApproachDel:      11.1            xxxxxx           xxxxxx            14.8
Delay Adj:        1.00             xxxxx            xxxxx            1.00
ApprAdjDel:       11.1            xxxxxx           xxxxxx            14.8
LOS by Appr:        B                *                *                B
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #42 Bancroft Way / College Avenue
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.747
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       17.0
Optimal Cycle:        0              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     343    0    0    0    0    0    0    0    0   34  203    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  343    0    0    0    0    0    0    0    0   34  203    0
Added Vol:    157    0    0    0    0    0    0    0    0    2  132    0
Future:        11    0    0    0    0    0    0    0    0   22   66    0
Initial Fut:  511    0    0    0    0    0    0    0    0   58  401    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   511    0    0    0    0    0    0    0    0   58  401    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  511    0    0    0    0    0    0    0    0   58  401    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   511    0    0    0    0    0    0    0    0   58  401    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.25 1.75 0.00
Final Sat.:   684    0    0    0    0    0    0    0    0  148 1039    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.75 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.39 0.39 xxxx
Crit Moves:  ****                                         ****
Delay/Veh:   21.4  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 12.2 12.1  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  21.4  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 12.2 12.1  0.0
LOS by Move:    C    *    *    *    *    *    *    *    *    B    B    *
ApproachDel:      21.4            xxxxxx           xxxxxx            12.1
Delay Adj:        1.00             xxxxx            xxxxx            1.00
ApprAdjDel:       21.4            xxxxxx           xxxxxx            12.1
LOS by Appr:        C                *                *                B
********************************************************************************
```

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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #43 Bancroft Way / Piedmont Avenue
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        1.256
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       95.0
Optimal Cycle:        0               Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     131  553    0    0  344  123    0    0    0    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  131  553    0    0  344  123    0    0    0    0    0    0
Added Vol:    104  119    0    0   46   30    0    0    0    0    0    0
Future:        11   66    0    0   44   66    0    0    0    0    0    0
Initial Fut:  246  738    0    0  434  219    0    0    0    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   246  738    0    0  434  219    0    0    0    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  246  738    0    0  434  219    0    0    0    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   246  738    0    0  434  219    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.25 0.75 0.00 0.00 0.66 0.34 0.00 0.00 0.00 0.00 0.00 0.00
Final Sat.:   196  588    0    0  533  269    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     1.26 1.26 xxxx xxxx 0.81 0.81 xxxx xxxx xxxx xxxx xxxx xxxx
Crit Moves:       ****                ****
Delay/Veh:  142.1  142  0.0  0.0 24.0 24.0  0.0  0.0  0.0  0.0  0.0  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 142.1  142  0.0  0.0 24.0 24.0  0.0  0.0  0.0  0.0  0.0  0.0
LOS by Move:    F    F    *    *    C    C    *    *    *    *    *    *
ApproachDel:      142.1            24.0           xxxxxx           xxxxxx
Delay Adj:         1.00            1.00            xxxxx            xxxxx
ApprAdjDel:       142.1            24.0           xxxxxx           xxxxxx
LOS by Appr:        F                C                *                *
********************************************************************************
```



```
--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #44 Durant Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.750
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       14.2
Optimal Cycle:       59               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted      Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   19   19   19    5   19   19   17   17   17    0    0    0
Lanes:       1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      55  943  136   67  886    8    9   70   35    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   55  943  136   67  886    8    9   70   35    0    0    0
Added Vol:      0  118  105   66   33    0    0    0    0    0    0    0
Future:        10   90   70   40  180   10  200   40    0    0    0    0
Initial Fut:   65 1151  311  173 1099   18  209  110   35    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    65 1151  311  173 1099   18  209  110   35    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   65 1151  311  173 1099   18  209  110   35    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    65 1151  311  173 1099   18  209  110   35    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  1.00 0.95 0.95 1.00 0.95 0.95 0.95 0.95 0.95 1.00 1.00 1.00
Lanes:       1.00 1.57 0.43 1.00 1.97 0.03 1.00 0.76 0.24 0.00 0.00 0.00
Final Sat.:  1900 2842  768 1900 3552   58 1805 1369  436    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.40 0.40 0.09 0.31 0.31 0.12 0.08 0.08 0.00 0.00 0.00
Crit Moves:       ****      ****                ****
Green/Cycle: 0.45 0.45 0.45 0.10 0.55 0.55 0.26 0.28 0.28 0.00 0.00 0.00
Volume/Cap:  0.08 0.90 0.90 0.90 0.56 0.56 0.44 0.29 0.29 0.00 0.00 0.00
Delay/Veh:    4.7 15.4 15.4 68.8  2.7  2.7 21.8 18.9 18.9  0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:   4.7 15.4 15.4 68.8  2.7  2.7 21.8 18.9 18.9  0.0  0.0  0.0
DesignQueue:    1   25    7    6   19    0    6    3    1    0    0    0
********************************************************************************
```

```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #45 Durant Avenue / Fulton Street
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.459
Loss Time (sec):      8 (Y+R =  3 sec) Average Delay (sec/veh):       10.9
Optimal Cycle:       51              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0     0     0   21    21     0   22    22    22     0     0     0
Lanes:        0  0  0  0  0    1  1  1  0  0    1  0  1  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0     0     0  459   656     0  123   262    27     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0     0     0  459   656     0  123   262    27     0     0     0
Added Vol:      0     0     0   96    34     0   13   159     0     0     0     0
Future:         0     0     0   30    40     0   20    90    30     0     0     0
Initial Fut:    0     0     0  585   730     0  156   511    57     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0     0     0  585   730     0  156   511    57     0     0     0
Reduct Vol:     0     0     0    0     0     0    0     0     0     0     0     0
Reduced Vol:    0     0     0  585   730     0  156   511    57     0     0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0     0     0  585   730     0  156   511    57     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.95 0.95  1.00  0.99 0.94  0.94  1.00 1.00  1.00
Lanes:       0.00 0.00  0.00  1.33 1.67  0.00  1.00 1.80  0.20  0.00 0.00  0.00
Final Sat.:     0     0     0 2409 3006     0 1872 3199   357     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.24 0.24  0.00  0.08 0.16  0.16  0.00 0.00  0.00
Crit Moves:                        ****             ****
Green/Cycle: 0.00 0.00  0.00  0.53 0.53  0.00  0.35 0.35  0.35  0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.00  0.46 0.46  0.00  0.24 0.46  0.46  0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0   7.4  7.4   0.0  15.9 17.7  17.7   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0   7.4  7.4   0.0  15.9 17.7  17.7   0.0  0.0   0.0
DesignQueue:    0     0     0   11    13     0    4    13     1     0     0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #46 Durant Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.371
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       12.0
Optimal Cycle:       43              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    18    18    0     0     0   17    17     0     0     0     0
Lanes:        0  0  1  1  0    0  0  0  0  0    0  1  2  0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0   362    86    0     0     0   73   387     0     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0   362    86    0     0     0   73   387     0     0     0     0
Added Vol:      0     7    24    0     0     0   17   141     0     0     0     0
Future:         0   110    40    0     0     0    0   130     0     0     0     0
Initial Fut:    0   479   150    0     0     0   90   658     0     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0   479   150    0     0     0   90   658     0     0     0     0
Reduct Vol:     0     0     0    0     0     0    0     0     0     0     0     0
Reduced Vol:    0   479   150    0     0     0   90   658     0     0     0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0   479   150    0     0     0   90   658     0     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.92  0.92  1.00 1.00  1.00  0.91 0.91  1.00  1.00 1.00  1.00
Lanes:       0.00 1.52  0.48  0.00 0.00  0.00  0.36 2.64  0.00  0.00 0.00  0.00
Final Sat.:     0 2650   830     0    0     0   624 4563     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.18  0.00 0.00  0.00  0.14 0.14  0.00  0.00 0.00  0.00
Crit Moves:       ****                               ****
Green/Cycle: 0.00 0.49  0.49  0.00 0.00  0.00  0.39 0.39  0.00  0.00 0.00  0.00
Volume/Cap:  0.00 0.37  0.37  0.00 0.00  0.00  0.37 0.37  0.00  0.00 0.00  0.00
Delay/Veh:    0.0  8.8   8.8   0.0  0.0   0.0  14.7 14.7   0.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  8.8   8.8   0.0  0.0   0.0  14.7 14.7   0.0   0.0  0.0   0.0
DesignQueue:    0     9     3    0     0     0    2    15     0     0     0     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #47 Durant Avenue / College Avenue
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.457
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       13.8
Optimal Cycle:       42               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   18    18    0    0     0   16   16    16    0    0     0
Lanes:       0  0  0  1  0   0  1  0  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  213    66   13   23     0   64  228    87    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  213    66   13   23     0   64  228    87    0    0     0
Added Vol:     0   29    40    0    2     0  128   40     2    0    0     0
Future:        0   11    99    0   22     0   22   99    44    0    0     0
Initial Fut:   0  253   205   13   47     0  214  367   133    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  253   205   13   47     0  214  367   133    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  253   205   13   47     0  214  367   133    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  253   205   13   47     0  214  367   133    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.94  0.94 0.92 0.92  1.00 0.96 0.91  0.91 1.00 1.00  1.00
Lanes:       0.00 0.55  0.45 0.22 0.78  0.00 1.00 1.47  0.53 0.00 0.00  0.00
Final Sat.:    0  987   799  377 1363     0 1824 2544   922    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.26  0.26 0.03 0.03  0.00 0.12 0.14  0.14 0.00 0.00  0.00
Crit Moves:       ****                            ****
Green/Cycle: 0.00 0.56  0.56 0.56 0.56  0.00 0.32 0.32  0.32 0.00 0.00  0.00
Volume/Cap:  0.00 0.46  0.46 0.06 0.06  0.00 0.37 0.46  0.46 0.00 0.00  0.00
Delay/Veh:    0.0  7.1   7.1  6.6  6.6   0.0 18.6 18.7  18.7  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  7.1   7.1  6.6  6.6   0.0 18.6 18.7  18.7  0.0  0.0   0.0
DesignQueue:   0    4     3    0    1     0    5    9     3    0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #48 Durant Avenue / Piedmont Avenue
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        1.128
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       55.9
Optimal Cycle:        0               Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1  0  0   0  0  1  0  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  489     0    0  345     0  158    0    86    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  489     0    0  345     0  158    0    86    0    0     0
Added Vol:     0  153     0    0   46     0   71    0     9    0    0     0
Future:        0   50     0    0   40     0   30    0    60    0    0     0
Initial Fut:   0  692     0    0  431     0  259    0   155    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  692     0    0  431     0  259    0   155    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  692     0    0  431     0  259    0   155    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  692     0    0  431     0  259    0   155    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 1.00  0.00 0.00 1.00  0.00 1.00 0.00  1.00 0.00 0.00  0.00
Final Sat.:    0  613     0    0  583     0  471    0   557    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 1.13  xxxx xxxx 0.74  xxxx 0.55 xxxx  0.28 xxxx xxxx  xxxx
Crit Moves:       ****             ****        ****
Delay/Veh:    0.0 99.5   0.0  0.0 24.2   0.0 18.9  0.0  11.5  0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 99.5   0.0  0.0 24.2   0.0 18.9  0.0  11.5  0.0  0.0   0.0
LOS by Move:   *    F     *    *    C     *    C    *     B    *    *     *
ApproachDel:      99.5             24.2             16.1            xxxxxx
Delay Adj:        1.00             1.00             1.00             xxxxx
ApprAdjDel:       99.5             24.2             16.1            xxxxxx
LOS by Appr:        F                C                C                *
********************************************************************************
```

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-------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #49 Channing Way / Shattuck Avenue
*******************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.653
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        7.3
Optimal Cycle:       46               Level Of Service:                  A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16   16   16    16   22   22    22   22   22    22
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      42 1070    96   19  868    19   12   59    42   62   28    39
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   42 1070    96   19  868    19   12   59    42   62   28    39
Added Vol:      0  221    44    0   33     0    0    0     0    3    0     3
Future:        20  130    20   40   90    70   30   40    20   30   10    10
Initial Fut:   62 1421   160   59  991    89   42   99    62   95   38    52
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    62 1421   160   59  991    89   42   99    62   95   38    52
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   62 1421   160   59  991    89   42   99    62   95   38    52
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    62 1421   160   59  991    89   42   99    62   95   38    52
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.26 0.94  0.94 0.12 0.94  0.94 0.88 0.88  0.88 0.76 0.76  0.76
Lanes:       1.00 1.80  0.20 1.00 1.84  0.16 0.21 0.49  0.30 0.51 0.21  0.28
Final Sat.:   496 3196   360  222 3273   294  345  812   509  741  296   405
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.44  0.44 0.27 0.30  0.30 0.12 0.12  0.12 0.13 0.13  0.13
Crit Moves:       ****                                               ****
Green/Cycle: 0.54 0.54  0.54 0.54 0.54  0.54 0.34 0.34  0.34 0.34 0.34  0.34
Volume/Cap:  0.23 0.83  0.83 0.49 0.56  0.56 0.36 0.36  0.36 0.38 0.38  0.38
Delay/Veh:    3.8  7.0   7.0 15.9  3.4   3.4 18.0 18.0  18.0 18.5 18.5  18.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   3.8  7.0   7.0 15.9  3.4   3.4 18.0 18.0  18.0 18.5 18.5  18.5
DesignQueue:    1   27     3    1   18     2    1    2     2    2    1     1
*******************************************************************************
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-------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Future Volume Alternative)
*******************************************************************************
Intersection #50 Channing Way / Fulton Street
*******************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.604
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       14.7
Optimal Cycle:        0               Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  0  0   0  1  0  1  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0   86  543    51    0  132    20    7   72     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0   86  543    51    0  132    20    7   72     0
Added Vol:      0    0     0   32    2     0    0   44     0    0    6     0
Future:         0    0     0    0   30     0    0   90     0   10   40     0
Initial Fut:    0    0     0  118  575    51    0  266    20   17  118     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0  118  575    51    0  266    20   17  118     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  118  575    51    0  266    20   17  118     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0    0     0  118  575    51    0  266    20   17  118     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 0.32 1.54  0.14 0.00 0.93  0.07 0.13 0.87  0.00
Final Sat.:     0    0     0  195  975    88    0  579    44   73  509     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx 0.60 0.59  0.58 xxxx 0.46  0.46 0.23 0.23  xxxx
Crit Moves:                  ****                  ****          ****
Delay/Veh:    0.0  0.0   0.0 16.7 15.9  15.3  0.0 13.1  13.1 10.6 10.6   0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 16.7 15.9  15.3  0.0 13.1  13.1 10.6 10.6   0.0
LOS by Move:    *    *     *    C    C     C    *    B     B    B    B     *
ApproachDel:     xxxxxx           16.0             13.1             10.6
Delay Adj:        xxxxx           1.00             1.00             1.00
ApprAdjDel:      xxxxxx           16.0             13.1             10.6
LOS by Appr:        *               C                B                B
*******************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #51 Channing Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         65                Critical Vol./Cap. (X):        0.491
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        11.9
Optimal Cycle:       43                Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18    0    0     0   17   17     0    0   17    17
Lanes:       0  1  0  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00-9:00 AM (WB thru adjusted due
Base Vol:     56  423    79    0    0     0   16  179     0    0   98     9
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  56  423    79    0    0     0   16  179     0    0   98     9
Added Vol:     0   30    68    0    0     0    0   76     0    0    6     0
Future:       10   40    30    0    0     0   60   30     0    0   30    50
Initial Fut:  66  493   177    0    0     0   76  285     0    0  134    59
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   66  493   177    0    0     0   76  285     0    0  134    59
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  66  493   177    0    0     0   76  285     0    0  134    59
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   66  493   177    0    0     0   76  285     0    0  134    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.88 0.88  0.88 1.00 1.00  1.00 0.90 0.90  1.00 1.00 0.96  0.96
Lanes:       0.18 1.34  0.48 0.00 0.00  0.00 0.21 0.79  0.00 0.00 0.69  0.31
Final Sat.:   301 2247   807    0    0     0  360 1349     0    0 1265   557
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.22  0.22 0.00 0.00  0.00 0.21 0.21  0.00 0.00 0.11  0.11
Crit Moves:       ****                            ****
Green/Cycle: 0.45 0.45  0.45 0.00 0.00  0.00 0.43 0.43  0.00 0.00 0.43  0.43
Volume/Cap:  0.49 0.49  0.49 0.00 0.00  0.00 0.49 0.49  0.00 0.00 0.25  0.25
Delay/Veh:   11.0 11.0  11.0  0.0  0.0   0.0 13.9 13.9   0.0  0.0 12.0  12.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  11.0 11.0  11.0  0.0  0.0   0.0 13.9 13.9   0.0  0.0 12.0  12.0
DesignQueue:    1   10     4    0    0     0    2    6     0    0    3     1
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #52 Channing Way / College Avenue
********************************************************************************
Cycle (sec):         65                Critical Vol./Cap. (X):        0.619
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        21.4
Optimal Cycle:       43                Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18   18   18    18    0    0     0   17   17    17
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM (WB thru, NB righ
Base Vol:     26  256    22    6   92     2   21   76    31   88  150    43
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  26  256    22    6   92     2   21   76    31   88  150    43
Added Vol:    25   68    -4    0    4     0    0    9     2    0   77     0
Future:       20   50    20    0   60    10   10   40    30   70   40    30
Initial Fut:  71  374    38    6  156    12   31  125    63  158  267    73
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   71  374    38    6  156    12   31  125    63  158  267    73
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  71  374    38    6  156    12   31  125    63  158  267    73
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   71  374    38    6  156    12   31  125    63  158  267    73
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.92 0.92  0.92 0.99 0.99  0.99 0.96 0.96  0.96 0.98 0.98  0.98
Lanes:       0.15 0.77  0.08 0.03 0.90  0.07 0.14 0.57  0.29 0.32 0.53  0.15
Final Sat.:   258 1359   138   65 1688   130  258 1042   525  591  998   273
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.28 0.28  0.28 0.09 0.09  0.09 0.12 0.12  0.12 0.27 0.27  0.27
Crit Moves:       ****                                             ****
Green/Cycle: 0.58 0.58  0.58 0.58 0.58  0.58 0.30 0.30  0.30 0.30 0.30  0.30
Volume/Cap:  0.47 0.47  0.47 0.16 0.16  0.16 0.40 0.40  0.40 0.90 0.90  0.90
Delay/Veh:    6.5  6.5   6.5  4.2  4.2   4.2 20.5 20.5  20.5 42.2 42.2  42.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   6.5  6.5   6.5  4.2  4.2   4.2 20.5 20.5  20.5 42.2 42.2  42.2
DesignQueue:    1    6     1    0    2     0    1    3     2    4    7     2
********************************************************************************
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-----------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #53 Haste Street / Shattuck Avenue
*****************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):        0.710
Loss Time (sec):       8 (Y+R =  6 sec) Average Delay (sec/veh):       45.0
Optimal Cycle:        47               Level Of Service:                 D
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    21   21    0    0   21   21    0    0    0   18   18   18
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      66 1117    0    0  903   46    0    0    0  185  276   75
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   66 1117    0    0  903   46    0    0    0  185  276   75
Added Vol:      0  264    0    0   31    5    0    0    0    4    8    0
Future:        10  130    0    0  110   20    0    0    0   30  110   20
Initial Fut:   76 1511    0    0 1044   71    0    0    0  219  394   95
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    76 1511    0    0 1044   71    0    0    0  219  394   95
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   76 1511    0    0 1044   71    0    0    0  219  394   95
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    76 1511    0    0 1044   71    0    0    0  219  394   95
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  0.17 0.95 1.00 1.00 0.94 0.94 1.00 1.00 1.00 0.91 0.91 0.91
Lanes:       1.00 2.00 0.00 0.00 1.87 0.13 0.00 0.00 0.00 0.62 1.11 0.27
Final Sat.:   315 3610    0    0 3346  228    0    0    0 1072 1929  465
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.42 0.00 0.00 0.31 0.31 0.00 0.00 0.00 0.20 0.20 0.20
Crit Moves:       ****                                          ****
Green/Cycle: 0.37 0.37 0.00 0.00 0.37 0.37 0.00 0.00 0.00 0.51 0.51 0.51
Volume/Cap:  0.65 1.13 0.00 0.00 0.84 0.84 0.00 0.00 0.00 0.40 0.40 0.40
Delay/Veh:   35.2 81.5  0.0  0.0 18.1 18.1  0.0  0.0  0.0 10.6 10.6 10.6
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  35.2 81.5  0.0  0.0 18.1 18.1  0.0  0.0  0.0 10.6 10.6 10.6
DesignQueue:    2   38    0    0   26    2    0    0    0    4    7    2
*****************************************************************************
```



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-----------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #54 Haste Street / Fulton Street
*****************************************************************************
Cycle (sec):          80               Critical Vol./Cap. (X):        0.379
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       15.2
Optimal Cycle:        53               Level Of Service:                 B
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0    0   25   25    0    0    0   20   20    0
Lanes:        0  0  0  0  0   0  0  1  1  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0    0    0  433  145    0    0    0   23  380    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:    0    0    0    0  433  145    0    0    0   23  380    0
Added Vol:      0    0    0    0    1    1    0    0    0    0   12    0
Future:         0    0    0    0   50   20    0    0    0    0  140    0
Initial Fut:    0    0    0    0  484  166    0    0    0   23  532    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:     0    0    0    0  484  166    0    0    0   23  532    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:    0    0    0    0  484  166    0    0    0   23  532    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:     0    0    0    0  484  166    0    0    0   23  532    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  1.00 1.00 1.00 1.00 0.91 0.91 1.00 1.00 1.00 0.95 0.95 1.00
Lanes:       0.00 0.00 0.00 0.00 1.49 0.51 0.00 0.00 0.00 0.08 1.92 0.00
Final Sat.:     0    0    0    0 2586  887    0    0    0  150 3460    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00 0.00 0.19 0.19 0.00 0.00 0.00 0.15 0.15 0.00
Crit Moves:                      ****                                ****
Green/Cycle: 0.00 0.00 0.00 0.00 0.49 0.49 0.00 0.00 0.00 0.41 0.41 0.00
Volume/Cap:  0.00 0.00 0.00 0.00 0.38 0.38 0.00 0.00 0.00 0.38 0.38 0.00
Delay/Veh:    0.0  0.0  0.0  0.0 13.2 13.2  0.0  0.0  0.0 17.4 17.4  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:   0.0  0.0  0.0  0.0 13.2 13.2  0.0  0.0  0.0 17.4 17.4  0.0
DesignQueue:    0    0    0    0   11    4    0    0    0    1   15    0
*****************************************************************************
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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #55 Haste Street / Telegraph Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.447
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       16.9
Optimal Cycle:       40              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16     0    0    0     0    0    0     0    0   16    16
Lanes:       0  1  1  0  0   0  0  0  0  0   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     216  520     0    0    0     0    0    0     0    0  334    34
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  216  520     0    0    0     0    0    0     0    0  334    34
Added Vol:      0   98     0    0    0     0    0    0     0    0   12     0
Future:        20   50     0    0    0     0    0    0     0    0   90    30
Initial Fut:  236  668     0    0    0     0    0    0     0    0  436    64
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   236  668     0    0    0     0    0    0     0    0  436    64
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  236  668     0    0    0     0    0    0     0    0  436    64
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   236  668     0    0    0     0    0    0     0    0  436    64
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.95  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.93  0.93
Lanes:       0.52 1.48  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 1.74  0.26
Final Sat.:   942 2668     0    0    0     0    0    0     0    0 3088   453
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.25 0.25  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.14  0.14
Crit Moves:       ****                                             ****
Green/Cycle: 0.34 0.34  0.34 0.00 0.00  0.00 0.00 0.00  0.00 0.53 0.53  0.53
Volume/Cap:  0.73 0.73  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.26  0.26
Delay/Veh:   21.6 21.6   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  8.6   8.6
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  21.6 21.6   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0  8.6   8.6
DesignQueue:    6   17     0    0    0     0    0    0     0    0    8     1
********************************************************************************
```



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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #56 Haste Street / College Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.622
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       11.2
Optimal Cycle:       40              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16     0    0   16    16    0    0     0   16   16    16
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     167  267     0    0  115    69    0    0     0   48  223    21
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  167  267     0    0  115    69    0    0     0   48  223    21
Added Vol:     19   89     0    0    6     0    0    0     0    0   12     0
Future:        30   40     0    0   90    60    0    0     0   30   30    40
Initial Fut:  216  396     0    0  211   129    0    0     0   78  265    61
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   216  396     0    0  211   129    0    0     0   78  265    61
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  216  396     0    0  211   129    0    0     0   78  265    61
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   216  396     0    0  211   129    0    0     0   78  265    61
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.75 0.75  1.00 1.00 0.95  0.95 1.00 1.00  1.00 0.91 0.91  0.91
Lanes:       0.35 0.65  0.00 0.00 0.62  0.38 0.00 0.00  0.00 0.39 1.31  0.30
Final Sat.:   504  925     0    0 1119   684    0    0     0  665 2260   520
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.43 0.43  0.00 0.00 0.19  0.19 0.00 0.00  0.00 0.12 0.12  0.12
Crit Moves:       ****                                             ****
Green/Cycle: 0.63 0.63  0.00 0.00 0.63  0.63 0.00 0.00  0.00 0.25 0.25  0.25
Volume/Cap:  0.68 0.68  0.00 0.00 0.30  0.30 0.00 0.00  0.00 0.48 0.48  0.48
Delay/Veh:    7.9  7.9   0.0  0.0  3.4   3.4  0.0  0.0   0.0 22.8 22.8  22.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   7.9  7.9   0.0  0.0  3.4   3.4  0.0  0.0   0.0 22.8 22.8  22.8
DesignQueue:    3    6     0    0    3     2    0    0     0    2    7     2
********************************************************************************
```

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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #57 Dwight Way / Martin Luther King Way
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.876
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):      22.2
Optimal Cycle:       83              Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    21   21    21     0    0     0
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:      62  690    66    88  868   163    68  419    83     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   62  690    66    88  868   163    68  419    83     0    0     0
Added Vol:      3    9     0     0   15    10     0  115    19     0    0     0
Future:        20   30    10    10  200    50    10   50    10     0    0     0
Initial Fut:   85  729    76    98 1083   223    78  584   112     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    85  729    76    98 1083   223    78  584   112     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   85  729    76    98 1083   223    78  584   112     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    85  729    76    98 1083   223    78  584   112     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.60 0.60  0.60  0.74 0.74  0.74  0.91 0.91  0.91  1.00 1.00  1.00
Lanes:       0.19 1.64  0.17  0.14 1.54  0.32  0.20 1.51  0.29  0.00 0.00  0.00
Final Sat.:   218 1874   195   195 2158   444   348 2605   500     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.39 0.39  0.39  0.50 0.50  0.50  0.22 0.22  0.22  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.53 0.53  0.53  0.53 0.53  0.53  0.30 0.30  0.30  0.00 0.00  0.00
Volume/Cap:  0.74 0.74  0.74  0.95 0.95  0.95  0.75 0.75  0.75  0.00 0.00  0.00
Delay/Veh:   13.2 13.2  13.2  25.4 25.4  25.4  27.0 27.0  27.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  13.2 13.2  13.2  25.4 25.4  25.4  27.0 27.0  27.0   0.0  0.0   0.0
DesignQueue:    2   14     1     2   22     5     2   17     3     0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #58 Dwight Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.921
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):      16.8
Optimal Cycle:       92              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  1  1  0    1  0  1  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0 1094   113    95  989     0    66  420   151     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1094   113    95  989     0    66  420   151     0    0     0
Added Vol:      0  226     0     2   32     0    39   77     0     0    0     0
Future:         0  130    30    10  110     0    20   50    10     0    0     0
Initial Fut:    0 1450   143   107 1131     0   125  547   161     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1450   143   107 1131     0   125  547   161     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1450   143   107 1131     0   125  547   161     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1450   143   107 1131     0   125  547   161     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  0.22 0.95  0.95  0.90 0.90  0.90  1.00 1.00  1.00
Lanes:       0.00 1.82  0.18  1.00 2.00  0.00  0.30 1.31  0.39  0.00 0.00  0.00
Final Sat.:     0 3243   320   424 3610     0   511 2235   658     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.45  0.45  0.25 0.31  0.00  0.24 0.24  0.24  0.00 0.00  0.00
Crit Moves:       ****        ****                   ****
Green/Cycle: 0.00 0.49  0.49  0.55 0.55  0.00  0.27 0.27  0.27  0.00 0.00  0.00
Volume/Cap:  0.00 0.92  0.92  0.46 0.57  0.00  0.92 0.92  0.92  0.00 0.00  0.00
Delay/Veh:    0.0 15.4  15.4  10.6  3.0   0.0  39.2 39.2  39.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 15.4  15.4  10.6  3.0   0.0  39.2 39.2  39.2   0.0  0.0   0.0
DesignQueue:    0   30     3     4   20     0     4   15     5     0    0     0
********************************************************************************
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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #59 Dwight Way / Fulton Street
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.493
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      13.7
Optimal Cycle:       45              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    21    21    0    0     0   16    16     0    0     0
Lanes:       0  0  0  0  1   2  0  0  0  0   0  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0    12   449    0    0     0  620     6     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0    12   449    0    0     0  620     6     0    0     0
Added Vol:     0    0     0     1    0    0     0   79     0     0    0     0
Future:        0    0    10    30    0    0     0   70    30     0    0     0
Initial Fut:   0    0    22   480    0    0     0  769    36     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0    22   480    0    0     0  769    36     0    0     0
Reduct Vol:    0    0     0     0    0    0     0    0     0     0    0     0
Reduced Vol:   0    0    22   480    0    0     0  769    36     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0    0    22   480    0    0     0  769    36     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  0.87  0.59 1.00  1.00  1.00 0.94  0.94  1.00 1.00  1.00
Lanes:       0.00 0.00  1.00  2.00 0.00  0.00  0.00 1.91  0.09  0.00 0.00  0.00
Final Sat.:    0    0  1644  2260    0    0     0 3424   160     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.01  0.21 0.00  0.00  0.00 0.22  0.22  0.00 0.00  0.00
Crit Moves:                   ****                  ****
Green/Cycle: 0.00 0.00  0.43  0.43 0.00  0.00  0.00 0.46  0.46  0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.03  0.49 0.00  0.00  0.00 0.49  0.49  0.00 0.00  0.00
Delay/Veh:    0.0  0.0  11.6  16.2  0.0   0.0   0.0 12.2  12.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0  11.6  16.2  0.0   0.0   0.0 12.2  12.2   0.0  0.0   0.0
DesignQueue:   0    0     0    11    0    0     0   17     1     0    0     0
********************************************************************************
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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #60 Dwight Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.763
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      18.3
Optimal Cycle:       52              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   15    15     0    0    0    17   17    17     0    0     0
Lanes:       0  0  1  1  0   0  0  0  0  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  697    78     0    0    0    66  479   565     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  697    78     0    0    0    66  479   565     0    0     0
Added Vol:     0   30     0     0    0    0    68   12     3     0    0     0
Future:        0   66    11     0    0    0    11   66    44     0    0     0
Initial Fut:   0  793    89     0    0    0   145  557   612     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  793    89     0    0    0   145  557   612     0    0     0
Reduct Vol:    0    0     0     0    0    0     0    0     0     0    0     0
Reduced Vol:   0  793    89     0    0    0   145  557   612     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0  793    89     0    0    0   145  557   612     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  1.00 1.00  1.00  0.82 0.82  0.82  1.00 1.00  1.00
Lanes:       0.00 1.80  0.20  0.00 0.00  0.00  0.22 0.85  0.93  0.00 0.00  0.00
Final Sat.:    0 3197   359     0    0    0   345 1324  1454     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.25  0.00 0.00  0.00  0.42 0.42  0.42  0.00 0.00  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.00 0.33  0.33  0.00 0.00  0.00  0.55 0.55  0.55  0.00 0.00  0.00
Volume/Cap:  0.00 0.76  0.76  0.00 0.00  0.00  0.76 0.76  0.76  0.00 0.00  0.00
Delay/Veh:    0.0 23.8  23.8   0.0  0.0   0.0  14.5 14.5  14.5   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 23.8  23.8   0.0  0.0   0.0  14.5 14.5  14.5   0.0  0.0   0.0
DesignQueue:   0   21     2     0    0    0     3   10    11     0    0     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #61 Dwight Way / College Avenue
********************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):         0.561
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        12.5
Optimal Cycle:        39              Level Of Service:                   B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   16    16   16   16     0   15   15    15    0    0     0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  365    51   10  150     0   68  352    85    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  365    51   10  150     0   68  352    85    0    0     0
Added Vol:      0  100     0    0    6     0    7    4     0    0    0     0
Future:         0   50    10   20   90     0   20   20    10    0    0     0
Initial Fut:    0  515    61   30  246     0   95  376    95    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96
PHF Volume:     0  536    64   31  256     0   99  392    99    0    0     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0  536    64   31  256     0   99  392    99    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0  536    64   31  256     0   99  392    99    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.99  0.99 0.92 0.92  1.00 0.90 0.90  0.90 1.00 1.00  1.00
Lanes:       0.00 0.89  0.11 0.11 0.89  0.00 0.34 1.33  0.33 0.00 0.00  0.00
Final Sat.:     0 1675   198  190 1560     0  576 2280   576    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.32  0.32 0.16 0.16  0.00 0.17 0.17  0.17 0.00 0.00  0.00
Crit Moves:       ****                            ****
Green/Cycle: 0.00 0.57  0.57 0.57 0.57  0.00 0.31 0.31  0.31 0.00 0.00  0.00
Volume/Cap:  0.00 0.56  0.56 0.29 0.29  0.00 0.56 0.56  0.56 0.00 0.00  0.00
Delay/Veh:    0.0  7.8   7.8  5.3  5.3   0.0 20.7 20.7  20.7  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  7.8   7.8  5.3  5.3   0.0 20.7 20.7  20.7  0.0  0.0   0.0
DesignQueue:    0    9     1    1    4     0    3   10     3    0    0     0
********************************************************************************
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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #62 Dwight Way / Piedmont Avenue / Warring Street
********************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):         0.469
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        10.9
Optimal Cycle:        61              Level Of Service:                   B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   22     0   29   29     0   24   24    24   24    0    24
Lanes:        0  0  1  1  0   0  1  1  0  0   1  0  1  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: 7:00 AM - 9:00 AM
Base Vol:       0  583     0    8  324     0   91  143   238   42    0    48
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  583     0    8  324     0   91  143   238   42    0    48
Added Vol:      0  198     0    0   18     0    1    0     3    0    0     0
Future:         0   77    11   11   44     0   11   11    33   11    0    11
Initial Fut:    0  858    11   19  386     0  103  154   274   53    0    59
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0  858    11   19  386     0  103  154   274   53    0    59
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0  858    11   19  386     0  103  154   274   53    0    59
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0  858    11   19  386     0  103  154   274   53    0    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.95  0.95 0.86 0.86  1.00 0.71 1.00  0.85 0.77 1.00  0.77
Lanes:       0.00 1.97  0.03 0.09 1.91  0.00 1.00 1.00  1.00 0.47 0.00  0.53
Final Sat.:     0 3557    46  154 3121     0 1347 1900  1615  695    0   774
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.24  0.24 0.12 0.12  0.00 0.08 0.08  0.17 0.08 0.00  0.08
Crit Moves:       ****                                  ****
Green/Cycle: 0.00 0.51  0.51 0.51 0.51  0.00 0.37 0.37  0.37 0.37 0.00  0.37
Volume/Cap:  0.00 0.48  0.48 0.24 0.24  0.00 0.21 0.22  0.46 0.21 0.00  0.21
Delay/Veh:    0.0  8.7   8.7  7.1  7.1   0.0 14.9 14.8  18.1 14.9  0.0  14.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  8.7   8.7  7.1  7.1   0.0 14.9 14.8  18.1 14.9  0.0  14.9
DesignQueue:    0   16     0    0    7     0    2    4     6    1    0     1
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #63 Dwight Avenue / Prospect Street
********************************************************************************
Average Delay (sec/veh):      6.3          Worst Case Level Of Service:        B
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:           Include          Include          Include           Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:        0    0     0   14    0   109   246   72     0     0   53    15
Growth Adj:   1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0   14    0   109   246   72     0     0   53    15
Added Vol:       0    0     0    0    0     0     0    0     0     0    0     0
Future:          0    0     0    0    0    20    30    0     0     0   20     0
Initial Fut:     0    0     0   14    0   129   276   72     0     0   73    15
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0   14    0   129   276   72     0     0   73    15
Reduct Vol:      0    0     0    0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0   14    0   129   276   72     0     0   73    15
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   705 xxxx    81    88 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   406 xxxx   985  1520 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   339 xxxx   985  1520 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  830 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 10.2 xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx             10.2             xxxxxx            xxxxxx
ApproachLOS:        *                 B                 *                 *
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #64 Adeline Street / Ward Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        0.901
Loss Time (sec):       8 (Y+R =  6 sec) Average Delay (sec/veh):       20.4
Optimal Cycle:        82              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected         Permitted
Rights:           Include          Include          Include           Include
Min. Green:      0   25    25     0   25    25    19    0    19     0    0     0
Lanes:        0  0  0  1  0    0  0  2  0  1    2  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:        0  784     3     0  736   546   723    0     4     0    0     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0  784     3     0  736   546   723    0     4     0    0     0
Added Vol:       0  186     0     0   23     7    58    0     0     0    0     0
Future:          0   50     0     0   40    70   100    0     0     0    0     0
Initial Fut:     0 1020     3     0  799   623   881    0     4     0    0     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0 1020     3     0  799   623   881    0     4     0    0     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:     0 1020     3     0  799   623   881    0     4     0    0     0
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:      0 1020     3     0  799   623   881    0     4     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   1.00 1.00  1.00  1.00 0.95  0.85  0.92 1.00  0.85  1.00 1.00  1.00
Lanes:        0.00 0.99  0.01  0.00 2.00  1.00  2.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:      0 1894     6     0 3610  1615  3502    0  1615     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.54  0.54  0.00 0.22  0.39  0.25 0.00  0.00  0.00 0.00  0.00
Crit Moves:        ****                         ****
Green/Cycle:  0.00 0.58  0.58  0.00 0.58  0.58  0.29 0.00  0.29  0.00 0.00  0.00
Volume/Cap:   0.00 0.92  0.92  0.00 0.38  0.66  0.86 0.00  0.01  0.00 0.00  0.00
Delay/Veh:     0.0 25.8  25.8   0.0  7.7  12.7  31.2  0.0  16.4   0.0  0.0   0.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:    0.0 25.8  25.8   0.0  7.7  12.7  31.2  0.0  16.4   0.0  0.0   0.0
DesignQueue:     0   18     0     0   13    10    24    0     0     0    0     0
********************************************************************************
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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #65 Derby Street / Warring Street
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        1.609
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):      240.2
Optimal Cycle:        0               Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0    0  650    0   31   14   20    0    0   34  779
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   0    0    0  650    0   31   14   20    0    0   34  779
Added Vol:     0    0    0   21    0    0    0    0    0    0    0  198
Future:        0    0    0   90    0   10    0   10    0    0    0   90
Initial Fut:   0    0    0  761    0   41   14   30    0    0   34 1067
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    0    0    0  761    0   41   14   30    0    0   34 1067
Reduct Vol:    0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   0    0    0  761    0   41   14   30    0    0   34 1067
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    0    0    0  761    0   41   14   30    0    0   34 1067
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.00 0.00 0.00 0.95 0.00 0.05 0.32 0.68 0.00 0.00 0.03 0.97
Final Sat.:    0    0    0  574    0   31  166  355    0    0   21  663
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx xxxx 1.33 xxxx 1.33 0.08 0.08 xxxx xxxx 1.61 1.61
Crit Moves:                 ****                ****                     ****
Delay/Veh:    0.0  0.0  0.0 176.6  0.0 176.6 10.5 10.5  0.0  0.0  296 295.7
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:   0.0  0.0  0.0 176.6  0.0 176.6 10.5 10.5  0.0  0.0  296 295.7
LOS by Move:   *    *    *    F    *    F    B    B    *    *    F    F
ApproachDel:    xxxxxx          176.6            10.5            295.7
Delay Adj:       xxxxx           1.00            1.00             1.00
ApprAdjDel:     xxxxxx          176.6            10.5            295.7
LOS by Appr:       *               F                B                F
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #66 Derby Street / Claremont Blvd.
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.740
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       30.8
Optimal Cycle:       61               Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Split Phase      Split Phase       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18    0   18    0    0    0    0   35   35   35   35    0
Lanes:       0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      5    0   64    0    0    0    0  665   12   52  813    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   5    0   64    0    0    0    0  665   12   52  813    0
Added Vol:     0    0    0    0    0    0    0   21    0    0  198    0
Future:        0    0    0    0    0    0    0  100    0    0   90    0
Initial Fut:   5    0   64    0    0    0    0  786   12   52 1101    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    5    0   64    0    0    0    0  786   12   52 1101    0
Reduct Vol:    0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   5    0   64    0    0    0    0  786   12   52 1101    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    5    0   64    0    0    0    0  786   12   52 1101    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  0.87 1.00 0.87 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.07 0.00 0.93 0.00 0.00 0.00 0.00 0.98 0.02 0.05 0.95 0.00
Final Sat.:   120    0 1536    0    0    0    0 1868   29   86 1814    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.00 0.04 0.00 0.00 0.00 0.00 0.42 0.42 0.61 0.61 0.00
Crit Moves:  ****                                                ****
Green/Cycle: 0.28 0.00 0.28 0.00 0.00 0.00 0.00 0.60 0.60 0.60 0.60 0.00
Volume/Cap:  0.15 0.00 0.15 0.00 0.00 0.00 0.00 0.71 0.71 1.02 1.02 0.00
Delay/Veh:   18.3  0.0 18.3  0.0  0.0  0.0  0.0 12.8 12.8 44.0 44.0  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  18.3  0.0 18.3  0.0  0.0  0.0  0.0 12.8 12.8 44.0 44.0  0.0
DesignQueue:    0    0    2    0    0    0    0   13    0    1   19    0
********************************************************************************
```

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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #67 Ashby Avenue / Seventh Street
********************************************************************************
Cycle (sec):          95              Critical Vol./Cap. (X):          0.976
Loss Time (sec):      12 (Y+R =  4 sec) Average Delay (sec/veh):        53.9
Optimal Cycle:       155              Level Of Service:                   D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted       Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:     4   19    19     4   19    19     4   22    22     4   20    20
Lanes:        0  1  0  1  0    0  1  0  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:      62  162    54    54  193   224   433  915   306   111  663    25
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   62  162    54    54  193   224   433  915   306   111  663    25
Added Vol:      0    0     0     0    0     0     0   95     0     0   12     0
Future:       100   70    20    60   20    30    50   60    40    50   60    30
Initial Fut:  162  232    74   114  213   254   483 1070   346   161  735    55
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   162  232    74   114  213   254   483 1070   346   161  735    55
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  162  232    74   114  213   254   483 1070   346   161  735    55
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   162  232    74   114  213   254   483 1070   346   161  735    55
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.55 0.55  0.55  0.85 0.85  0.85  0.95 0.91  0.91  0.95 0.94  0.94
Lanes:       0.69 0.99  0.32  0.39 0.73  0.88  1.00 1.51  0.49  1.00 1.86  0.14
Final Sat.:   721 1032   329   632 1180  1408  1805 2627   849  1805 3325   249
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.22  0.22  0.18 0.18  0.18  0.27 0.41  0.41  0.09 0.22  0.22
Crit Moves:       ****                                     ****              ****
Green/Cycle: 0.26 0.26  0.26  0.26 0.26  0.26  0.40 0.40  0.40  0.22 0.21  0.21
Volume/Cap:  0.86 0.86  0.86  0.69 0.69  0.69  0.67 1.02  1.02  0.41 1.07  1.07
Delay/Veh:   47.1 47.1  47.1  34.3 34.3  34.3  23.6 54.3  54.3  34.2 94.3  94.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  47.1 47.1  47.1  34.3 34.3  34.3  23.6 54.3  54.3  34.2 94.3  94.3
DesignQueue:    7    9     3     5    9    10    16   38    12     7   33     2
********************************************************************************
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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #68 Ashby Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap. (X):          0.973
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        42.2
Optimal Cycle:       163              Level Of Service:                   D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     4   17    17     4   19    19    18   18    18    18   18    18
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     173  521    53   137  741   128    84  584   134    51  613   135
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  173  521    53   137  741   128    84  584   134    51  613   135
Added Vol:      2   20    57     0   28     2     0   81    14    30    8     0
Future:        20  220    20    20  320    30    20  120    10    20   80    50
Initial Fut:  195  761   130   157 1089   160   104  785   158   101  701   185
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   195  761   130   157 1089   160   104  785   158   101  701   185
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  195  761   130   157 1089   160   104  785   158   101  701   185
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   195  761   130   157 1089   160   104  785   158   101  701   185
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.93  0.93  0.16 0.93  0.93  0.60 0.60  0.60
Lanes:       1.00 1.71  0.29  1.00 1.74  0.26  1.00 1.66  0.34  0.20 1.43  0.37
Final Sat.:  1805 3015   515  1805 3088   454   300 2930   590   233 1615   426
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.25  0.25  0.09 0.35  0.35  0.35 0.27  0.27  0.43 0.43  0.43
Crit Moves:  ****                   ****                               ****
Green/Cycle: 0.11 0.35  0.35  0.12 0.36  0.36  0.45 0.45  0.45  0.45 0.45  0.45
Volume/Cap:  0.97 0.72  0.72  0.72 0.97  0.97  0.78 0.60  0.60  0.97 0.97  0.97
Delay/Veh:   99.7 30.1  30.1  53.0 50.2  50.2  47.7 21.6  21.6  48.9 48.9  48.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  99.7 30.1  30.1  53.0 50.2  50.2  47.7 21.6  21.6  48.9 48.9  48.9
DesignQueue:   10   29     5     8   42     6     3   26     5     3   23     6
********************************************************************************
```

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-----------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #69 Ashby Avenue / Adeline Street
*****************************************************************************
Cycle (sec):       140              Critical Vol./Cap. (X):        0.623
Loss Time (sec):    16 (Y+R =  4 sec) Average Delay (sec/veh):      42.1
Optimal Cycle:      96              Level Of Service:                  D
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    4   38    38    6   38    38    4   22    22    4   32    32
Lanes:        1  0  1  1  0   1  0  2  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     74  567    61   11  438    96  189  564    49   83  549    14
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  74  567    61   11  438    96  189  564    49   83  549    14
Added Vol:     4   14     0    0    2     5   44   78     1    0   19     0
Future:       30   50    10   10   10    50   50  110    20   10  190     0
Initial Fut: 108  631    71   21  450   151  283  752    70   93  758    14
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  108  631    71   21  450   151  283  752    70   93  758    14
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 108  631    71   21  450   151  283  752    70   93  758    14
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  108  631    71   21  450   151  283  752    70   93  758    14
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.95 0.94  0.94 0.95 0.88  0.88 0.95 0.94  0.94 0.95 0.95  0.95
Lanes:      1.00 1.80  0.20 1.00 2.25  0.75 1.00 1.83  0.17 1.00 1.96  0.04
Final Sat.: 1805 3196   360 1805 3736  1254 1805 3260   303 1805 3534    65
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.06 0.20  0.20 0.01 0.12  0.12 0.16 0.23  0.23 0.05 0.21  0.21
Crit Moves: ****                  ****       ****                  ****
Green/Cycle: 0.09 0.31 0.31 0.05 0.27  0.27 0.22 0.43  0.43 0.10 0.31  0.31
Volume/Cap:  0.70 0.64 0.64 0.24 0.44  0.44 0.70 0.53  0.53 0.53 0.70  0.70
Delay/Veh:   75.9 43.1 43.1 65.5 42.5  42.5 57.5 25.5  25.5 70.0 44.2  44.2
User DelAdj: 1.00 1.00 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  75.9 43.1 43.1 65.5 42.5  42.5 57.5 25.5  25.5 70.0 44.2  44.2
DesignQueue:    8   36    4    2   26     9   18   35     3    7   43     1
*****************************************************************************
```



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-----------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                AM Peak Hour
-----------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #70 Ashby Avenue / Shattuck Avenue
*****************************************************************************
Cycle (sec):        80              Critical Vol./Cap. (X):        0.568
Loss Time (sec):    12 (Y+R =  5 sec) Average Delay (sec/veh):      16.8
Optimal Cycle:      53              Level Of Service:                  B
*****************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   21   21    21    6   21    21   20   20    20   20   20    20
Lanes:        0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     77  590    26  124  450    35   33  557    31   40  550   182
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  77  590    26  124  450    35   33  557    31   40  550   182
Added Vol:     0  110     0    5   12     6   58   20     0    0   13    16
Future:       30   20    10   20   10    10   10  110    10   10  150    10
Initial Fut: 107  720    36  149  472    51  101  687    41   50  713   208
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  107  720    36  149  472    51  101  687    41   50  713   208
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 107  720    36  149  472    51  101  687    41   50  713   208
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  107  720    36  149  472    51  101  687    41   50  713   208
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:      0.25 1.67  0.08 0.44 1.41  0.15 0.24 1.66  0.10 0.10 1.47  0.43
Final Sat.:  471 3170   159  843 2669   288  463 3149   188  196 2790   814
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.23 0.23  0.23 0.18 0.18  0.18 0.22 0.22  0.22 0.26 0.26  0.26
Crit Moves:      ****                                              ****
Green/Cycle: 0.40 0.40 0.40 0.40 0.40  0.40 0.45 0.45  0.45 0.45 0.45  0.45
Volume/Cap:  0.57 0.57 0.57 0.44 0.44  0.44 0.48 0.48  0.48 0.57 0.57  0.57
Delay/Veh:   20.2 20.2 20.2 18.4 18.4  18.4 13.9 13.9  13.9 15.0 15.0  15.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  20.2 20.2 20.2 18.4 18.4  18.4 13.9 13.9  13.9 15.0 15.0  15.0
DesignQueue:    3   20    1    4   13     1    3   18     1    1   19     5
*****************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #71 Ashby Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):         80              Critical Vol./Cap. (X):        0.909
Loss Time (sec):     12 (Y+R =  6 sec) Average Delay (sec/veh):      26.9
Optimal Cycle:      100              Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted       Prot+Permit       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    21   21    21    0   21    21   25   25    25   25   25    25
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     150  985    80  148  623   103   86  549   120   89  573    83
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  150  985    80  148  623   103   86  549   120   89  573    83
Added Vol:      3   29     0    0    3     0    0   25     0    0   26     2
Future:        50   40    10   10   60    30   20   90    20   10   80    10
Initial Fut:  203 1054    90  158  686   133  106  664   140   99  679    95
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   203 1054    90  158  686   133  106  664   140   99  679    95
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  203 1054    90  158  686   133  106  664   140   99  679    95
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   203 1054    90  158  686   133  106  664   140   99  679    95
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.26 0.94  0.94 0.27 0.93  0.93 0.21 0.93  0.93 0.19 0.93  0.93
Lanes:       1.00 1.84  0.16 1.00 1.68  0.32 1.00 1.65  0.35 1.00 1.75  0.25
Final Sat.:   494 3286   281  515 2951   572  393 2904   612  361 3110   435
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.41 0.32  0.32 0.31 0.23  0.23 0.27 0.23  0.23 0.27 0.22  0.22
Crit Moves:  ****           ****                            ****
Green/Cycle: 0.43 0.43  0.43 0.53 0.53  0.53 0.32 0.32  0.32 0.32 0.32  0.32
Volume/Cap:  0.96 0.75  0.75 0.58 0.44  0.44 0.83 0.71  0.71 0.85 0.67  0.67
Delay/Veh:   74.4 22.7  22.7 23.0 12.5  12.5 68.1 26.5  26.5 73.6 25.7  25.7
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  74.4 22.7  22.7 23.0 12.5  12.5 68.1 26.5  26.5 73.6 25.7  25.7
DesignQueue:    5   29     2    6   15     3    3   21     4    3   22     3
********************************************************************************
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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #72 Ashby Avenue / College Avenue
********************************************************************************
Cycle (sec):         60              Critical Vol./Cap. (X):        1.187
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):      36.9
Optimal Cycle:      180              Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18   18   18    18   30   30    30   30   30    30
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      79  323    26  118  232    95   33  490    92    4  611   229
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   79  323    26  118  232    95   33  490    92    4  611   229
Added Vol:      0   26     0    4    3     0   18    7     0    0   28    56
Future:        20   20    10   20   20    60   20   80    10   10   20    30
Initial Fut:   99  369    36  142  255   155   71  577   102   14  659   315
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    99  369    36  142  255   155   71  577   102   14  659   315
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   99  369    36  142  255   155   71  577   102   14  659   315
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    99  369    36  142  255   155   71  577   102   14  659   315
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.81 0.81  0.81 0.73 0.73  0.73 0.84 0.84  0.84 0.95 0.95  0.95
Lanes:       0.20 0.73  0.07 0.26 0.46  0.28 0.09 0.77  0.14 0.01 0.67  0.32
Final Sat.:   303 1128   110  355  637   387  150 1223   216   25 1198   573
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.33 0.33  0.33 0.40 0.40  0.40 0.47 0.47  0.47 0.55 0.55  0.55
Crit Moves:                      ****                                 ****
Green/Cycle: 0.38 0.38  0.38 0.45 0.45  0.45 0.53 0.53  0.53 0.54 0.54  0.54
Volume/Cap:  0.87 0.87  0.87 0.89 0.89  0.89 0.90 0.90  0.90 1.03 1.03  1.03
Delay/Veh:   32.6 32.6  32.6 29.9 29.9  29.9 27.3 27.3  27.3 50.3 50.3  50.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  32.6 32.6  32.6 29.9 29.9  29.9 27.3 27.3  27.3 50.3 50.3  50.3
DesignQueue:    2    8     1    3    5     3    1   10     2    0   12     6
********************************************************************************
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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #73 Ashby Avenue / Claremont Avenue
*******************************************************************************
Cycle (sec):         80               Critical Vol./Cap. (X):        0.844
Loss Time (sec):     12 (Y+R =  6 sec) Average Delay (sec/veh):       27.7
Optimal Cycle:       81               Level Of Service:                  C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16    16   16    16    28   28    28    28   28    28
Lanes:        0  1  0  1  0    1  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      35  288   153   321  272    59    43  504    13    90  637   429
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   35  288   153   321  272    59    43  504    13    90  637   429
Added Vol:      0    0     0    21    0     0     0   10     0     0   85   198
Future:        20   10    30    40   50    10    30   60    10    30   20    50
Initial Fut:   55  298   183   382  322    69    73  574    23   120  742   677
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    55  298   183   382  322    69    73  574    23   120  742   677
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   55  298   183   382  322    69    73  574    23   120  742   677
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    55  298   183   382  322    69    73  574    23   120  742   677
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
Lanes:       0.21 1.11  0.68  1.48 1.25  0.27  0.22 1.71  0.07  0.16 0.96  0.88
Final Sat.:   370 2007  1233  2676 2256   483   393 3093   124   281 1740  1588
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.15  0.15  0.14 0.14  0.14  0.19 0.19  0.19  0.43 0.43  0.43
Crit Moves:  ****              ****                                    ****
Green/Cycle: 0.20 0.20  0.20  0.20 0.20  0.20  0.45 0.45  0.45  0.45 0.45  0.45
Volume/Cap:  0.74 0.74  0.74  0.71 0.71  0.71  0.41 0.41  0.41  0.95 0.95  0.95
Delay/Veh:   34.2 34.2  34.2  32.1 32.1  32.1  12.6 12.6  12.6  29.7 29.7  29.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  34.2 34.2  34.2  32.1 32.1  32.1  12.6 12.6  12.6  29.7 29.7  29.7
DesignQueue:    2   11     7    14   12     3     2   15     1     3   20    19
*******************************************************************************
```



```
-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #74 Tunnel Road / SR 13
*******************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.836
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       17.3
Optimal Cycle:       64               Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include            Ovl
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  2  0  1    2  0  1  0  0    0  0  0  0  0    1  0  0  0  2
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0 1293   435   487  608     0     0    0     0   205    0   307
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1293   435   487  608     0     0    0     0   205    0   307
Added Vol:      0  283     0    16   15     0     0    0     0     0    0     0
Future:         0   80     0    60   70     0     0    0     0     0    0    20
Initial Fut:    0 1656   435   563  693     0     0    0     0   205    0   327
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1656   435   563  693     0     0    0     0   205    0   327
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1656   435   563  693     0     0    0     0   205    0   327
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1656   435   563  693     0     0    0     0   205    0   327
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.85  0.92 1.00  1.00  1.00 1.00  1.00  0.95 1.00  0.75
Lanes:       0.00 2.00  1.00  2.00 1.00  0.00  0.00 0.00  0.00  1.00 0.00  2.00
Final Sat.:     0 3610  1615  3502 1900     0     0    0     0  1805    0  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.46  0.27  0.16 0.36  0.00  0.00 0.00  0.00  0.11 0.00  0.12
Crit Moves:       ****        ****                                ****
Green/Cycle: 0.00 0.55  0.55  0.19 0.74  0.00  0.00 0.00  0.00  0.14 0.00  0.33
Volume/Cap:  0.00 0.84  0.49  0.84 0.49  0.00  0.00 0.00  0.00  0.84 0.00  0.35
Delay/Veh:    0.0 15.5   9.5  34.2  3.7   0.0   0.0  0.0   0.0  48.8  0.0  16.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 15.5   9.5  34.2  3.7   0.0   0.0  0.0   0.0  48.8  0.0  16.8
DesignQueue:    0   30     8    17    7     0     0    0     0     7    0     8
*******************************************************************************
```

```
---------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
          1994 HCM Unsignalized Method (Future Volume Alternative)
*********************************************************************************
Intersection #167 Piedmont Avenue / Channing Way
*********************************************************************************
Average Delay (sec/veh):      6.4          Worst Case Level Of Service:        F
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      65  457    24    23  308    38    25   19    23    20   58    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   65  457    24    23  308    38    25   19    23    20   58    18
Added Vol:     35  153     0     0   13    42     0    0     5     0    0     0
Future:        11   78     4     4   52     6     4    3     4     3   10     3
Initial Fut:  111  688    28    27  373    86    29   22    32    23   68    21
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   111  688    28    27  373    86    29   22    32    23   68    21
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   111  688    28    27  373    86    29   22    32    23   68    21
Adjusted Volume Module:
Grade:            0%               0%               0%               0%
% Cycle/Cars:   xxxx  xxxx       xxxx  xxxx       xxxx  xxxx       xxxx  xxxx
% Truck/Comb:   xxxx  xxxx       xxxx  xxxx       xxxx  xxxx       xxxx  xxxx
PCE Adj:     1.10 1.00  1.00  1.10 1.00  1.00  1.10 1.10  1.10  1.10 1.10  1.10
Cycl/Car PCE:   xxxx  xxxx       xxxx  xxxx       xxxx  xxxx       xxxx  xxxx
Trck/Cmb PCE:   xxxx  xxxx       xxxx  xxxx       xxxx  xxxx       xxxx  xxxx
Adj Vol.:     122  688    28    30  373    86    32   24    35    25   75    23
Critical Gap Module:
MoveUp Time:  2.1 xxxx xxxxx   2.1 xxxx xxxxx   3.4  3.3   2.6   3.4  3.3   2.6
Critical Gp:  5.0 xxxx xxxxx   5.0 xxxx xxxxx   6.5  6.0   5.5   6.5  6.0   5.5
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  459 xxxx xxxxx   716 xxxx xxxxx  1301 1270   416  1283 1299   702
Potent Cap.: 1036 xxxx xxxxx   781 xxxx xxxxx   187  235   852   191  227   610
Adj Cap:     1.00 xxxx xxxxx  1.00 xxxx xxxxx  0.52 0.75  1.00  0.70 0.75  1.00
Move Cap.:   1036 xxxx xxxxx   781 xxxx xxxxx    98  178   852   134  171   610
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  3.9 xxxx xxxxx   4.8 xxxx xxxxx  52.1 23.1   4.4  32.4 34.6   6.1
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  181 xxxxx  xxxx  186 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 36.4 xxxxx xxxxx 47.7 xxxxx
Shared LOS:     *    *     *     *    *     *     *    E     *     *    F     *
ApproachDel:        0.6              0.3             36.4             47.7
```



```
---------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  AM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*********************************************************************************
Intersection #1121 Highland Place / Heart Avenue / Cyclotron Road
*********************************************************************************
Average Delay (sec/veh):      1.5          Worst Case Level Of Service:        C
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       4    1     0    12    0    57    12  281     4     0   53     2
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    4    1     0    12    0    57    12  281     4     0   53     2
Added Vol:      0    0     0     0    0     0     0   85     0     0   14     0
Future:         1    0     0     2    1     6     5   26     0     0  161    20
Initial Fut:    5    1     0    14    1    63    17  392     4     0  228    22
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     5    1     0    14    1    63    17  392     4     0  228    22
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     5    1     0    14    1    63    17  392     4     0  228    22
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx   7.1  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  699  678 xxxxx   668  669   239   250 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  357  377 xxxxx   375  381   805  1327 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    325  372 xxxxx   370  376   805  1327 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.7 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:  332 xxxx xxxxx  xxxx  657 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 16.0 xxxx xxxxx xxxxx 11.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     C    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:       16.0             11.2            xxxxxx           xxxxxx
ApproachLOS:         C                B                *                *
```

```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1122 Stadium Rim Road / Canyon Road
********************************************************************************
Average Delay (sec/veh):      0.1          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    0  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  246     4     0  134     0     0    0     0     1    0     2
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  246     4     0  134     0     0    0     0     1    0     2
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0   43     1     0   23     0     0    0     0     0    0     0
Initial Fut:    0  289     5     0  157     0     0    0     0     1    0     2
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  289     5     0  157     0     0    0     0     1    0     2
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  289     5     0  157     0     0    0     0     1    0     2
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   449 xxxx   292
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   572 xxxx   752
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   572 xxxx   752
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  681 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 10.3 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    B     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            10.3
ApproachLOS:         *                *                *               B
```

Project Scenario—P.M. Peak Hour

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------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #1 Marin Avenue / San Pablo Avenue
******************************************************************************
Cycle (sec):         90               Critical Vol./Cap. (X):        1.166
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):       96.4
Optimal Cycle:      180               Level Of Service:                  F
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     227 1022   114   169  659    18    18  656   137   145  736   154
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  227 1022   114   169  659    18    18  656   137   145  736   154
Added Vol:      5  121     3     1   20     0     0    3     1     1   18    19
Future:        30  209    50    90  221    28    27  181    10    47  163    90
Initial Fut:  262 1352   167   260  900    46    45  840   148   193  917   263
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   262 1352   167   260  900    46    45  840   148   193  917   263
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  262 1352   167   260  900    46    45  840   148   193  917   263
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   262 1352   167   260  900    46    45  840   148   193  917   263
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.94  0.94  0.95 0.93  0.93  0.95 0.92  0.92
Lanes:       1.00 1.78  0.22  1.00 1.90  0.10  1.00 1.70  0.30  1.00 1.55  0.45
Final Sat.:  1805 3162   391  1805 3410   174  1805 3002   529  1805 2713   778
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.43  0.43  0.14 0.26  0.26  0.02 0.28  0.28  0.11 0.34  0.34
Crit Moves:       ****        ****                   ****        ****
Green/Cycle: 0.17 0.37  0.37  0.12 0.32  0.32  0.02 0.24  0.24  0.09 0.31  0.31
Volume/Cap:  0.83 1.17  1.17  1.17 0.83  0.83  1.09 1.17  1.17  1.17 1.09  1.09
Delay/Veh:   53.1  112 111.7 151.7 34.0  34.0 213.4  122 121.5 162.4 87.8  87.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  53.1  112 111.7 151.7 34.0  34.0 213.4  122 121.5 162.4 87.8  87.8
DesignQueue:   11   48     6    12   33     2     2   34     6     9   35    10
******************************************************************************
```



```
------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #2 Marin Avenue / The Alameda
******************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.869
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       22.3
Optimal Cycle:       75               Level Of Service:                  C
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    25   25   25    25   25   25    23   23   23    23   23   23
Lanes:        0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     316  322     1    43  178    77    50  534   193    17  480    69
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  316  322     1    43  178    77    50  534   193    17  480    69
Added Vol:     21    4     5     0    1     0     0    5     1     1   16     0
Future:       130  110    10    10   30    70    20  200    80    10   70    10
Initial Fut:  467  436    16    53  209   147    70  739   274    28  566    79
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   467  436    16    53  209   147    70  739   274    28  566    79
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  467  436    16    53  209   147    70  739   274    28  566    79
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   467  436    16    53  209   147    70  739   274    28  566    79
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.61 0.61  0.61  0.70 0.70  0.70  0.78 0.78  0.78  0.80 0.80  0.80
Lanes:       1.00 0.96  0.04  0.26 1.02  0.72  0.13 1.36  0.51  0.08 1.69  0.23
Final Sat.:  1152 1111    41   347 1366   961   192 2031   753   126 2549   356
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.41 0.39  0.39  0.15 0.15  0.15  0.36 0.36  0.36  0.22 0.22  0.22
Crit Moves:  ****                                    ****
Green/Cycle: 0.47 0.47  0.47  0.47 0.47  0.47  0.42 0.42  0.42  0.42 0.42  0.42
Volume/Cap:  0.87 0.84  0.84  0.33 0.33  0.33  0.87 0.87  0.87  0.53 0.53  0.53
Delay/Veh:   26.4 24.2  24.2  12.4 12.4  12.4  26.9 26.9  26.9  16.8 16.8  16.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.4 24.2  24.2  12.4 12.4  12.4  26.9 26.9  26.9  16.8 16.8  16.8
DesignQueue:   10   10     0     1    4     3     2   18     7     1   13     2
******************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Gilman Street / Sixth Street

Cycle (sec):	70	Critical Vol./Cap. (X):	1.267
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	128.7
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Permitted	Permitted	Permitted	Permitted
Rights:	Include	Include	Include	Include
Lanes:	0 0 1! 0 0	0 1 0 1 0	0 0 1! 0 0	0 0 1! 0 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Min. Green:	19	19	19	19	19	19	19	19	19	19	19	19
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM												
Base Vol:	346	46	159	24	47	52	28	497	109	53	489	11
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	346	46	159	24	47	52	28	497	109	53	489	11
Added Vol:	9	0	0	0	0	0	0	0	2	0	1	0
PasserByVol:	120	0	93	20	90	0	0	193	180	122	41	0
Initial Fut:	475	46	252	44	137	52	28	690	291	175	531	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	475	46	252	44	137	52	28	690	291	175	531	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	475	46	252	44	137	52	28	690	291	175	531	11
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	475	46	252	44	137	52	28	690	291	175	531	11
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.96	0.65	0.65	0.79	0.79	0.79	0.94	0.94	0.94	0.61	0.61	0.61
Lanes:	0.52	0.07	0.41	0.38	1.17	0.45	0.03	0.68	0.29	0.24	0.74	0.02
Final Sat.:	946	92	502	564	1755	666	49	1216	513	282	857	18
Capacity Analysis Module:												
Vol/Sat:	0.50	0.50	0.50	0.08	0.08	0.08	0.57	0.57	0.57	0.62	0.62	0.62
Crit Moves:		****									****	
Green/Cycle:	0.27	0.27	0.31	0.31	0.31	0.31	0.63	0.63	0.63	0.63	0.63	0.63
Volume/Cap:	1.85	1.85	1.60	0.25	0.25	0.25	0.90	0.90	0.90	0.99	0.99	0.99
Delay/Veh:	417.0	417	302.4	18.5	18.5	18.5	22.9	22.9	22.9	42.9	42.9	42.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	417.0	417	302.4	18.5	18.5	18.5	22.9	22.9	22.9	42.9	42.9	42.9
DesignQueue:	15	1	7	1	4	1	0	12	5	3	9	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #4 Gilman Street / San Pablo Avenue

Cycle (sec):	100	Critical Vol./Cap. (X):	1.071
Loss Time (sec):	12 (Y+R = 5 sec)	Average Delay (sec/veh):	68.9
Optimal Cycle:	180	Level Of Service:	E

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Permitted	Permitted
Rights:	Include	Include	Include	Include
Lanes:	1 0 1 1 0	1 0 1 1 0	0 1 0 1 0	0 0 1! 0 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Min. Green:	4	35	35	4	35	35	31	31	31	31	31	31
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM												
Base Vol:	140	1057	87	126	830	112	174	345	155	40	233	82
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	140	1057	87	126	830	112	174	345	155	40	233	82
Added Vol:	1	130	0	0	22	0	0	0	0	0	0	0
PasserByVol:	60	183	40	20	180	30	107	50	120	10	30	44
Initial Fut:	201	1370	127	146	1032	142	281	395	275	50	263	126
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	201	1370	127	146	1032	142	281	395	275	50	263	126
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	201	1370	127	146	1032	142	281	395	275	50	263	126
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	201	1370	127	146	1032	142	281	395	275	50	263	126
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.93	0.93	0.57	0.57	0.57	0.67	0.67	0.67
Lanes:	1.00	1.83	0.17	1.00	1.76	0.24	0.59	0.83	0.58	0.11	0.60	0.29
Final Sat.:	1805	3261	302	1805	3116	429	636	894	622	145	765	366
Capacity Analysis Module:												
Vol/Sat:	0.11	0.42	0.42	0.08	0.33	0.33	0.44	0.44	0.44	0.34	0.34	0.34
Crit Moves:		****		****				****				
Green/Cycle:	0.12	0.39	0.39	0.08	0.35	0.35	0.41	0.41	0.41	0.41	0.41	0.41
Volume/Cap:	0.95	1.07	1.07	1.07	0.95	0.95	1.07	1.07	1.07	0.83	0.83	0.83
Delay/Veh:	93.1	76.1	76.1	143.7	47.1	47.1	80.6	80.6	80.6	40.7	40.7	40.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	93.1	76.1	76.1	143.7	47.1	47.1	80.6	80.6	80.6	40.7	40.7	40.7
DesignQueue:	10	52	5	8	41	6	10	14	10	2	9	4

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Rose Street / Shattuck Avenue
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.759
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       16.2
Optimal Cycle:       52              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   17   17    17    17   17    17    27   27    27    27   27    27
Lanes:        1  0  1  1  0    1  0  1  1  0    0  1  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     159  641    14   112  444    26    69  253    49    29  214   228
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  159  641    14   112  444    26    69  253    49    29  214   228
Added Vol:      0    9     0     1    2     0     0    0     0     0    0     4
Future:        60  230    20    10  220    10    10   10    30    20   10    10
Initial Fut:  219  880    34   123  666    36    79  263    79    49  224   242
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   219  880    34   123  666    36    79  263    79    49  224   242
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  219  880    34   123  666    36    79  263    79    49  224   242
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   219  880    34   123  666    36    79  263    79    49  224   242
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.32 0.94  0.94  0.23 0.94  0.94  0.77 0.77  0.85  0.88 0.88  0.88
Lanes:       1.00 1.93  0.07  1.00 1.90  0.10  0.23 0.77  1.00  0.10 0.43  0.47
Final Sat.:   602 3455   133   429 3397   184   338 1124  1615   159  726   784
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.36 0.25  0.25  0.29 0.20  0.20  0.23 0.23  0.05  0.31 0.31  0.31
Crit Moves:  ****                                                    ****
Green/Cycle: 0.48 0.48  0.48  0.48 0.48  0.48  0.41 0.41  0.41  0.41 0.41  0.41
Volume/Cap:  0.76 0.53  0.53  0.60 0.41  0.41  0.58 0.58  0.12  0.76 0.76  0.76
Delay/Veh:   26.0 13.1  13.1  18.1 12.0  12.0  17.5 17.5  13.0  22.8 22.8  22.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.0 13.1  13.1  18.1 12.0  12.0  17.5 17.5  13.0  22.8 22.8  22.8
DesignQueue:    5   19     1     3   14     1     2    6     2     1    6     6
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #6 Cedar Street / Martin Luther King Way
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        1.086
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       51.3
Optimal Cycle:      180              Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   20   20    20    20   20    20    20   20    20    20   20    20
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      53  614    65    30  541    12    20  297    57    68  296    65
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   53  614    65    30  541    12    20  297    57    68  296    65
Added Vol:      2   26     4     0    2     0     0    2     0     1   12     0
Future:        20  210    30    20   80    10    10  110    10    10   30    10
Initial Fut:   75  850    99    50  623    22    30  409    67    79  338    75
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    75  850    99    50  623    22    30  409    67    79  338    75
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   75  850    99    50  623    22    30  409    67    79  338    75
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    75  850    99    50  623    22    30  409    67    79  338    75
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.90 0.90  0.90  0.88 0.88  0.88  0.93 0.93  0.93  0.73 0.73  0.73
Lanes:       0.07 0.83  0.10  0.07 0.90  0.03  0.06 0.81  0.13  0.16 0.69  0.15
Final Sat.:   125 1418   165   121 1503    53   105 1433   235   224  957   212
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.60 0.60  0.60  0.41 0.41  0.41  0.29 0.29  0.29  0.35 0.35  0.35
Crit Moves:       ****                                                ****
Green/Cycle: 0.55 0.55  0.55  0.55 0.55  0.55  0.33 0.33  0.33  0.33 0.33  0.33
Volume/Cap:  1.09 1.09  1.09  0.75 0.75  0.75  0.88 0.88  0.88  1.09 1.09  1.09
Delay/Veh:   65.5 65.5  65.5  13.2 13.2  13.2  37.9 37.9  37.9  89.5 89.5  89.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  65.5 65.5  65.5  13.2 13.2  13.2  37.9 37.9  37.9  89.5 89.5  89.5
DesignQueue:    1   16     2     1   11     0     1   11     2     2    9     2
********************************************************************************
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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Cedar Street / Shattuck Avenue
********************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        0.764
Loss Time (sec):       8 (Y+R =  5 sec) Average Delay (sec/veh):       16.7
Optimal Cycle:        52              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   20   20    20   20   20    20   22   22    22   22   22    22
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     138  795    56  144  619    72   86  275    67   59  341   150
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  138  795    56  144  619    72   86  275    67   59  341   150
Added Vol:      0    8     0    0    1     0    0    6     0    1   13     1
Future:        20  230    40   20  210    10   10   80    40   60   20    40
Initial Fut:  158 1033    96  164  830    82   96  361   107  120  374   191
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   158 1033    96  164  830    82   96  361   107  120  374   191
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  158 1033    96  164  830    82   96  361   107  120  374   191
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   158 1033    96  164  830    82   96  361   107  120  374   191
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.31 0.94  0.94 0.24 0.94  0.94 0.18 0.97  0.97 0.24 0.95  0.95
Lanes:       1.00 1.83  0.17 1.00 1.82  0.18 1.00 0.77  0.23 1.00 0.66  0.34
Final Sat.:   595 3260   303  460 3243   320  346 1416   420  462 1194   610
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.27 0.32  0.32 0.36 0.26  0.26 0.28 0.25  0.25 0.26 0.31  0.31
Crit Moves:                  ****                                   ****
Green/Cycle: 0.54 0.53  0.53 0.53 0.53  0.53 0.34 0.34  0.34 0.34 0.34  0.34
Volume/Cap:  0.49 0.60  0.60 0.67 0.48  0.48 0.82 0.75  0.75 0.77 0.93  0.93
Delay/Veh:    7.5  4.0   4.0 16.5  3.2   3.2 64.7 27.3  27.3 48.9 42.8  42.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   7.5  4.0   4.0 16.5  3.2   3.2 64.7 27.3  27.3 48.9 42.8  42.8
DesignQueue:    3   19     2    3   15     1    2    9     3    3   10     5
********************************************************************************
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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Cedar Street / Oxford Street
********************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        1.104
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       62.9
Optimal Cycle:       180              Level Of Service:                  E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16    16   16   16    16   16   16    16   16   16    16
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      91  464    81   17  196    17   18  307    57   61  340    31
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   91  464    81   17  196    17   18  307    57   61  340    31
Added Vol:     17  112     0    0   14     2    4    0     2    0   -3     0
future:        40   80    20   10   10     0   20  120    40   50  100    10
Initial Fut:  148  656   101   27  220    19   42  427    99  111  437    41
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   148  656   101   27  220    19   42  427    99  111  437    41
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  148  656   101   27  220    19   42  427    99  111  437    41
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   148  656   101   27  220    19   42  427    99  111  437    41
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.88 0.88  0.88 0.89 0.89  0.89 0.91 0.91  0.91 0.72 0.72  0.72
Lanes:       0.16 0.73  0.11 0.10 0.83  0.07 0.07 0.76  0.17 0.19 0.74  0.07
Final Sat.:   274 1214   187  173 1406   121  128 1305   303  259 1021    96
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.54 0.54  0.54 0.16 0.16  0.16 0.33 0.33  0.33 0.43 0.43  0.43
Crit Moves:       ****                                              ****
Green/Cycle: 0.49 0.49  0.49 0.49 0.49  0.49 0.39 0.39  0.39 0.39 0.39  0.39
Volume/Cap:  1.10 1.10  1.10 0.32 0.32  0.32 0.84 0.84  0.84 1.10 1.10  1.10
Delay/Veh:   80.5 80.5  80.5 11.1 11.1  11.1 30.5 30.5  30.5 90.5 90.5  90.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  80.5 80.5  80.5 11.1 11.1  11.1 30.5 30.5  30.5 90.5 90.5  90.5
DesignQueue:    3   14     2    1    4     0    1   10     2    3   11     1
********************************************************************************
```

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---------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 PM Peak Hour
---------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #9 Cedar Street / Euclid Avenue
*********************************************************************************
Cycle (sec):         60               Critical Vol./Cap. (X):        0.637
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):        14.0
Optimal Cycle:       42               Level Of Service:                  B
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   17   17    17   17   17    17   17   17    17   17   17     0
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     90  226    29    7  127    44   51  180    49   18   91     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  90  226    29    7  127    44   51  180    49   18   91     0
Added Vol:     0    3     0    0    1     0    3    0     0    0   -2     0
Future:       50   30     0    0   10    20   40  100    40   10   70     0
Initial Fut: 140  259    29    7  138    64   94  280    89   28  159     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  140  259    29    7  138    64   94  280    89   28  159     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 140  259    29    7  138    64   94  280    89   28  159     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  140  259    29    7  138    64   94  280    89   28  159     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.82 0.82  0.82 0.95 0.95  0.95 0.87 0.87  0.87 0.91 0.91  1.00
Lanes:       0.33 0.60  0.07 0.03 0.66  0.31 0.20 0.61  0.19 0.15 0.85  0.00
Final Sat.:   512  948   106   60 1186   550  337 1004   319  259 1468     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.27 0.27  0.27 0.12 0.12  0.12 0.28 0.28  0.28 0.11 0.11  0.00
Crit Moves:       ****                            ****
Green/Cycle: 0.43 0.43  0.43 0.43 0.43  0.43 0.44 0.44  0.44 0.44 0.44  0.00
Volume/Cap:  0.64 0.64  0.64 0.27 0.27  0.27 0.64 0.64  0.64 0.25 0.25  0.00
Delay/Veh:   15.5 15.5  15.5 11.3 11.3  11.3 15.0 15.0  15.0 10.8 10.8   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  15.5 15.5  15.5 11.3 11.3  11.3 15.0 15.0  15.0 10.8 10.8   0.0
DesignQueue:    3    5     1    0    3     1    2    6     2    1    3     0
*********************************************************************************
```



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---------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 PM Peak Hour
---------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Future Volume Alternative)
*********************************************************************************
Intersection #10 Grizzly Peak Blvd / Centennial Drive
*********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.926
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):        27.3
Optimal Cycle:        0               Level Of Service:                  D
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:    162   65   250   33   30     8    3  159    45   22  111    25
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 162   65   250   33   30     8    3  159    45   22  111    25
Added Vol:     9    0    43    0    0     0    0    0     0    5    0     0
Future:       11    0    33    0    0     0    0   22    22   11   11     0
Initial Fut: 182   65   326   33   30     8    3  181    67   38  122    25
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90 0.90 0.90  0.90
PHF Volume:  202   72   362   37   33     9    3  201    74   42  136    28
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 202   72   362   37   33     9    3  201    74   42  136    28
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  202   72   362   37   33     9    3  201    74   42  136    28
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.32 0.11  0.57 0.47 0.42  0.11 0.01 0.72  0.27 0.21 0.66  0.13
Final Sat.:   218   78   391  237  216    58    7  412   152  112  358    73
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.93 0.93  0.93 0.15 0.15  0.15 0.49 0.49  0.49 0.38 0.38  0.38
Crit Moves:       ****       ****                 ****                  ****
Delay/Veh:   39.7 39.7  39.7 10.5 10.5  10.5 14.3 14.3  14.3 12.8 12.8  12.8
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  39.7 39.7  39.7 10.5 10.5  10.5 14.3 14.3  14.3 12.8 12.8  12.8
LOS by Move:    E    E     E    B    B     B    B    B     B    B    B     B
ApproachDel:      39.7             10.5             14.3             12.8
Delay Adj:        1.00             1.00             1.00             1.00
ApprAdjDel:       39.7             10.5             14.3             12.8
LOS by Appr:        E                B                B                B
*********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Hearst Avenue / Shattuck Avenue

Cycle (sec): 75 Critical Vol./Cap. (X): 0.929
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 25.6
Optimal Cycle: 101 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	22	22	22	22	22	22	22	22	22	22	22	22
Lanes:	1 0 1 1 0			1 0 1 1 0			0 1 0 1 0			0 1 0 1 0		
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	34	715	63	117	537	54	67	232	20	122	321	136
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	34	715	63	117	537	54	67	232	20	122	321	136
Added Vol:	22	6	-2	1	2	0	0	5	3	41	38	2
Future:	22	176	33	66	264	44	55	22	22	55	22	99
Initial Fut:	78	897	94	184	803	98	122	259	45	218	381	237
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	78	897	94	184	803	98	122	259	45	218	381	237
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	78	897	94	184	803	98	122	259	45	218	381	237
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	78	897	94	184	803	98	122	259	45	218	381	237
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.24	0.94	0.94	0.20	0.93	0.93	0.53	0.53	0.53	0.64	0.64	0.64
Lanes:	1.00	1.81	0.19	1.00	1.78	0.22	0.57	1.22	0.21	0.52	0.91	0.57
Final Sat.:	458	3222	338	380	3166	386	576	1222	212	630	1102	685
Capacity Analysis Module:												
Vol/Sat:	0.17	0.28	0.28	0.48	0.25	0.25	0.21	0.21	0.21	0.35	0.35	0.35
Crit Moves:				****							****	
Green/Cycle:	0.41	0.41	0.41	0.41	0.41	0.41	0.39	0.39	0.39	0.39	0.39	0.39
Volume/Cap:	0.42	0.68	0.68	1.19	0.62	0.62	0.55	0.55	0.55	0.89	0.89	0.89
Delay/Veh:	15.3	12.5	12.5	143.3	11.5	11.5	20.6	20.6	20.6	34.0	34.0	34.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.3	12.5	12.5	143.3	11.5	11.5	20.6	20.6	20.6	34.0	34.0	34.0
DesignQueue:	2	24	2	5	21	3	3	7	1	6	10	6

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #12 Hearst Avenue / Oxford Avenue

Cycle (sec): 75 Critical Vol./Cap. (X): 1.004
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 50.9
Optimal Cycle: 167 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	19	19	19	19	19	19	22	22	22	22	22	22
Lanes:	1 0 1 1 0			0 1 0 1 0			0 1 0 1 0			1 1 0 1 0		
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	80	743	315	30	458	25	23	267	115	313	478	52
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	80	743	315	30	458	25	23	267	115	313	478	52
Added Vol:	-1	103	12	17	48	24	2	2	0	53	58	4
Future:	33	121	44	11	77	22	0	88	44	44	1232	11
Initial Fut:	112	967	371	58	583	71	25	357	159	410	1768	67
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	112	967	371	58	583	71	25	357	159	410	1768	67
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	112	967	371	58	583	71	25	357	159	410	1768	67
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	112	967	371	58	583	71	25	357	159	410	1768	67
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.17	0.91	0.91	0.89	0.89	0.89	0.87	0.87	0.87	0.95	0.95	0.95
Lanes:	1.00	1.45	0.55	0.16	1.64	0.20	0.09	1.32	0.59	1.00	1.93	0.07
Final Sat.:	319	2499	959	277	2781	339	152	2175	969	1798	3464	131
Capacity Analysis Module:												
Vol/Sat:	0.35	0.39	0.39	0.21	0.21	0.21	0.16	0.16	0.16	0.23	0.51	0.51
Crit Moves:		****									****	
Green/Cycle:	0.32	0.32	0.32	0.32	0.32	0.32	0.58	0.58	0.58	0.58	0.58	0.58
Volume/Cap:	1.10	1.22	1.22	0.66	0.66	0.66	0.29	0.29	0.29	0.40	0.89	0.89
Delay/Veh:	144.8	131	130.8	24.6	24.6	24.6	8.5	8.5	8.5	9.0	18.9	18.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	144.8	131	130.8	24.6	24.6	24.6	8.5	8.5	8.5	9.0	18.9	18.9
DesignQueue:	3	30	12	2	17	2	0	7	3	8	36	1

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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #13 Hearst Avenue / Spruce Street
*******************************************************************************
Average Delay (sec/veh):      1.0          Worst Case Level Of Service:       C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  1  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:        0    0     0   11    0    48   34  579     0     0  792    13
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0   11    0    48   34  579     0     0  792    13
Added Vol:       0    0     0    1    0     0    0   31     0     0  115     5
Future:          0    0     0    0    0    20    0  130     0     0  170     0
Initial Fut:     0    0     0   12    0    68   34  740     0     0 1077    18
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0   12    0    68   34  740     0     0 1077    18
Reduct Vol:      0    0     0    0    0     0    0    0     0     0    0     0
Final Vol.:      0    0     0   12    0    68   34  740     0     0 1077    18
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1524 xxxx   547  1095 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   111 xxxx   486   645 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   106 xxxx   486   645 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  10.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     B    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  316 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 20.2 xxxxx  10.9 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    C     *     B    *     *     *    *     *
ApproachDel:     xxxxxx            20.2             xxxxxx           xxxxxx
ApproachLOS:        *                C                *                *
```



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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #14 Hearst Avenue / Arch Street / Le Conte Avenue
*******************************************************************************
Average Delay (sec/veh):      3.0          Worst Case Level Of Service:       C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:        0    0     0    6    0   135   146  439     0     0  668     6
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0    6    0   135   146  439     0     0  668     6
Added Vol:       0    0     0    0    0     0     3   28     0     0  120     0
Future:          0    0     0    0    0    40    50  100     0     0  150     0
Initial Fut:     0    0     0    6    0   175   199  567     0     0  938     6
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0    6    0   175   199  567     0     0  938     6
Reduct Vol:      0    0     0    0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0    6    0   175   199  567     0     0  938     6
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1623 xxxx   472   944 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx    95 xxxx   544   735 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx    75 xxxx   544   735 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  11.7 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     B    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  451 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 18.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    C     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            18.2             xxxxxx           xxxxxx
ApproachLOS:        *                C                *                *
```

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-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*****************************************************************************
Intersection #15 Hearst Avenue / Scenic Avenue
*****************************************************************************
Average Delay (sec/veh):      1.3          Worst Case Level Of Service:      B
*****************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:         Include          Include          Include          Include
Lanes:       0  0  0  0  0    0  0  0  0  1    0  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00-6:00 PM
Base Vol:       0    0     0     0    0   109     0  437     0     0  566    54
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0    0   109     0  437     0     0  566    54
Added Vol:      0    0     0     0    0    11     0    0     0     0  108     0
Future:         0    0     0     0    0    30     0  100     0     0  140    10
Initial Fut:    0    0     0     0    0   150     0  537     0     0  814    64
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0     0    0   150     0  537     0     0  814    64
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0     0    0   150     0  537     0     0  814    64
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx   439  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx   571  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx   571  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx  13.5 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     B     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx             13.5            xxxxxx           xxxxxx
ApproachLOS:        *                 B                *                *
```



```
-----------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
-----------------------------------------------------------------------------
                    Level Of Service Computation Report
         2000 HCM Operations Method (Future Volume Alternative)
*****************************************************************************
Intersection #16 Hearst Avenue / Euclid Avenue
*****************************************************************************
Cycle (sec):          80               Critical Vol./Cap. (X):        0.659
Loss Time (sec):      12 (Y+R =  3 sec) Average Delay (sec/veh):        18.0
Optimal Cycle:        53               Level Of Service:                  B
*****************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Permitted        Permitted        Permitted        Permitted
Rights:         Include          Include          Include          Include
Min. Green:     0    0     0    25    0    25     5   16     0    16   16    16
Lanes:       0  0  1! 0  0    0  0  1! 0  0    1  0  1  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:       4    0     1    57    0   115   120  307     0     2  503    23
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    4    0     1    57    0   115   120  307     0     2  503    23
Added Vol:      0    0     0     0    0     0     0   28     0     0   98     3
Future:         0    0     0    11    0    44    44   88     0     0  143    11
Initial Fut:    4    0     1    68    0   159   164  423     0     2  744    37
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     4    0     1    68    0   159   164  423     0     2  744    37
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    4    0     1    68    0   159   164  423     0     2  744    37
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     4    0     1    68    0   159   164  423     0     2  744    37
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.86 1.00  0.86  0.82 1.00  0.82  0.56 1.00  1.00  0.99 0.99  0.99
Lanes:       0.80 0.00  0.20  0.30 0.00  0.70  1.00 1.00  0.00  0.01 0.95  0.04
Final Sat.:  1306    0   326   467    0  1091  1062 1900     0     5 1795    89
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.15 0.00  0.15  0.15 0.22  0.00  0.41 0.41  0.41
Crit Moves:                   ****                                   ****
Green/Cycle: 0.31 0.00  0.31  0.31 0.00  0.31  0.54 0.54  0.00  0.54 0.54  0.54
Volume/Cap:  0.01 0.00  0.01  0.47 0.00  0.47  0.29 0.41  0.00  0.77 0.77  0.77
Delay/Veh:   19.0  0.0  19.0  25.3  0.0  25.3  11.4 12.2   0.0  20.3 20.3  20.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  19.0  0.0  19.0  25.3  0.0  25.3  11.4 12.2   0.0  20.3 20.3  20.3
DesignQueue:    0    0     0     2    0     5     3    9     0     0   17     1
*****************************************************************************
```

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---------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
---------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
***************************************************************************
Intersection #17 Hearst Avenue / Le Roy Avenue
***************************************************************************
Average Delay (sec/veh):      1.5          Worst Case Level Of Service:     C
***************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      0    0     0    12    0    56    38  355     0     0  523    21
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0     0    12    0    56    38  355     0     0  523    21
Added Vol:     0    0     0     0    0     0     0   29     0     0  101     0
Future:        0    0     0     0    0    10    20   90     0     0  140    10
Initial Fut:   0    0     0    12    0    66    58  474     0     0  764    31
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0     0    12    0    66    58  474     0     0  764    31
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    0    0     0    12    0    66    58  474     0     0  764    31
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1358 xxxx   780   795 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   155 xxxx   399   835 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   146 xxxx   399   835 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.6 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  315 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 20.1 xxxxx   9.6 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    C     *     A    *     *     *    *     *
ApproachDel:     xxxxxx             20.1            xxxxxx           xxxxxx
ApproachLOS:        *                 C                *                *
```



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---------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
---------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
***************************************************************************
Intersection #18 Hearst Avenue / Gayley Road / LaLoma Avenue
***************************************************************************
Cycle (sec):          70               Critical Vol./Cap. (X):        1.173
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       84.1
Optimal Cycle:       180               Level Of Service:                  F
***************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18    18   18    18    17   17    17    17   17    17
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:    318  288    19     4  203    49    28   52   288    69  197    40
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse: 318  288    19     4  203    49    28   52   288    69  197    40
Added Vol:    34   28     9     0   12     0     0    8    21    11   66     0
Future:       99   33    11     0    0    22    22   33    66    11   66    11
Initial Fut: 451  349    39     4  215    71    50   93   375    91  329    51
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:  451  349    39     4  215    71    50   93   375    91  329    51
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 451  349    39     4  215    71    50   93   375    91  329    51
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:  451  349    39     4  215    71    50   93   375    91  329    51
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.67 0.67  0.67  0.96 0.96  0.96  0.71 0.71  0.71  0.72 0.72  0.85
Lanes:       0.54 0.41  0.05  0.01 0.75  0.24  0.10 0.18  0.72  0.22 0.78  1.00
Final Sat.:   689  533    60    25 1351   446   130  242   975   298 1076  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.65 0.65  0.65  0.16 0.16  0.16  0.38 0.38  0.38  0.31 0.31  0.03
Crit Moves:       ****                              ****
Green/Cycle: 0.56 0.56  0.56  0.56 0.56  0.56  0.33 0.33  0.33  0.33 0.33  0.33
Volume/Cap:  1.17 1.17  1.17  0.29 0.29  0.29  1.17 1.17  1.17  0.93 0.93  0.10
Delay/Veh:  107.7  108 107.7   8.8  8.8   8.8 122.1  122 122.1  50.4 50.4  16.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 107.7  108 107.7   8.8  8.8   8.8 122.1  122 122.1  50.4 50.4  16.1
DesignQueue:    9    7     1     0    4     1     1    3    11     3    9     1
***************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #19 Berkeley Way / Oxford Street

Cycle (sec): 75 Critical Vol./Cap. (X): 0.560
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 9.9
Optimal Cycle: 46 Level Of Service: A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	18	18	18	18	18	18	20	20	20	20	20	20
Lanes:	1 0 1 1 0			1 0 1 1 0			0 0 1! 0 0			1 0 0 1 0		

Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM

Base Vol:	48	1039	3	4	890	22	72	2	51	29	18	42
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	48	1039	3	4	890	22	72	2	51	29	18	42
Added Vol:	5	92	0	0	97	3	23	0	34	0	0	0
Future:	20	160	0	0	170	0	10	0	10	20	0	10
Initial Fut:	73	1291	3	4	1157	25	105	2	95	49	18	52
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	73	1291	3	4	1157	25	105	2	95	49	18	52
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	73	1291	3	4	1157	25	105	2	95	49	18	52
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	73	1291	3	4	1157	25	105	2	95	49	18	52

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.18	0.95	0.95	0.15	0.95	0.95	0.75	0.75	0.75	0.75	0.89	0.89
Lanes:	1.00	1.99	0.01	1.00	1.96	0.04	0.52	0.01	0.47	1.00	0.26	0.74
Final Sat.:	350	3602	8	293	3523	76	741	14	671	1423	434	1255

Capacity Analysis Module:

Vol/Sat:	0.21	0.36	0.36	0.01	0.33	0.33	0.14	0.14	0.14	0.03	0.04	0.04
Crit Moves:		****						****				
Green/Cycle:	0.63	0.63	0.63	0.63	0.63	0.63	0.27	0.27	0.27	0.27	0.27	0.27
Volume/Cap:	0.33	0.57	0.57	0.02	0.52	0.52	0.53	0.53	0.53	0.13	0.16	0.16
Delay/Veh:	7.5	8.5	8.5	5.3	8.0	8.0	24.9	24.9	24.9	21.0	21.2	21.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	7.5	8.5	8.5	5.3	8.0	8.0	24.9	24.9	24.9	21.0	21.2	21.2
DesignQueue:	1	22	0	0	20	0	3	0	3	2	1	2

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #20 University Avenue / Sixth Street

Cycle (sec): 128 Critical Vol./Cap. (X): 1.047
Loss Time (sec): 16 (Y+R = 5 sec) Average Delay (sec/veh): 107.4
Optimal Cycle: 180 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	6	23	23	0	23	23	6	15	15	6	15	15
Lanes:	1 0 1 0 1			1 0 1 0 1			1 0 1 1 0			1 0 1 1 0		

Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM

Base Vol:	343	353	48	101	239	465	163	827	212	42	1205	33
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	343	353	48	101	239	465	163	827	212	42	1205	33
Added Vol:	0	4	2	0	19	8	1	37	0	5	269	0
Future:	10	70	40	100	130	100	20	200	20	20	120	10
Initial Fut:	353	427	90	201	388	573	184	1064	232	67	1594	43
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	353	427	90	201	388	573	184	1064	232	67	1594	43
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	353	427	90	201	388	573	184	1064	232	67	1594	43
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	353	427	90	201	388	573	184	1064	232	67	1594	43

Saturation Flow Module:

Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.98	1.00	0.85	1.00	1.00	0.85	0.95	0.92	0.92	0.95	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.64	0.36	1.00	1.95	0.05
Final Sat.:	1856	1900	1615	1900	1900	1615	1805	2884	629	1805	3501	94

Capacity Analysis Module:

Vol/Sat:	0.19	0.22	0.06	0.11	0.20	0.35	0.10	0.37	0.37	0.04	0.46	0.46
Crit Moves:	****					****	****				****	
Green/Cycle:	0.33	0.33	0.33	0.28	0.28	0.28	0.08	0.39	0.39	0.05	0.36	0.36
Volume/Cap:	0.58	0.68	0.17	0.38	0.73	1.27	1.27	0.94	0.94	0.79	1.27	1.27
Delay/Veh:	57.3	42.9	31.1	39.1	50.1	182.3	221.8	50.7	50.7	112.4	167	166.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	57.3	42.9	31.1	39.1	50.1	182.3	221.8	50.7	50.7	112.4	167	166.9
DesignQueue:	22	22	4	11	21	32	12	50	11	5	82	2

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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #21 University Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):        128              Critical Vol./Cap. (X):        1.108
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):      198.2
Optimal Cycle:      180              Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected         Protected        Protected
Rights:          Include          Include           Include          Include
Min. Green:    5   21    21    5   21    21    5   22    22    5   22    22
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     233  945    93   141  681    84    87  986   105    71  906   125
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  233  945    93   141  681    84    87  986   105    71  906   125
Added Vol:      1   19     1    11    8     0     0   38     0     6  274    83
Future:        50   90    10    20  220    60    90  190    80    10   60    20
Initial Fut:  284 1054   104   172  909   144   177 1214   185    87 1240   228
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   284 1054   104   172  909   144   177 1214   185    87 1240   228
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  284 1054   104   172  909   144   177 1214   185    87 1240   228
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   284 1054   104   172  909   144   177 1214   185    87 1240   228
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.95 0.93  0.93  0.95 0.93  0.93
Lanes:       1.00 1.82  0.18  1.00 1.73  0.27  1.00 1.74  0.26  1.00 1.69  0.31
Final Sat.:  1805 3243   320  1805 3051   483  1805 3070   468  1805 2979   548
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.33  0.33  0.10 0.30  0.30  0.10 0.40  0.40  0.05 0.42  0.42
Crit Moves:  ****                   ****       ****                   ****
Green/Cycle: 0.14 0.28  0.28  0.10 0.28  0.28  0.09 0.21  0.21  0.05 0.37  0.37
Volume/Cap:  1.13 1.16  1.16  1.00 1.06  1.06  1.13 1.88  1.88  0.97 1.13  1.13
Delay/Veh:  150.9  130 129.7 127.2 93.3  93.3 169.1  453 453.0 149.0  109 108.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 150.9  130 129.7 127.2 93.3  93.3 169.1  453 453.0 149.0  109 108.7
DesignQueue:   18   59     6    11   50     8    12   76    12     6   62    11
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #22 University Avenue / Martin Luther King Way
********************************************************************************
Cycle (sec):         85              Critical Vol./Cap. (X):        0.986
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       41.4
Optimal Cycle:      180              Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Prot+Permit        Permitted         Permitted        Permitted
Rights:          Include          Include           Include          Include
Min. Green:    5   23    23   23   23    23   17   17    17   17   17    17
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     282  902    78    46  702    77    80  679   134    71  727    81
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  282  902    78    46  702    77    80  679   134    71  727    81
Added Vol:     12   25     0     0    3     1     0   50     0     3  353     0
Future:        30  200    20    30   60    10    30  170    40    10   70    10
Initial Fut:  324 1127    98    76  765    88   110  899   174    84 1150    91
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   324 1127    98    76  765    88   110  899   174    84 1150    91
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  324 1127    98    76  765    88   110  899   174    84 1150    91
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   324 1127    98    76  765    88   110  899   174    84 1150    91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.37 0.94  0.94  0.13 0.94  0.94  0.14 0.93  0.93  0.14 0.94  0.94
Lanes:       1.00 1.84  0.16  1.00 1.79  0.21  1.00 1.68  0.32  1.00 1.85  0.15
Final Sat.:   709 3281   285   251 3189   367   268 2952   571   268 3308   262
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.46 0.34  0.34  0.30 0.24  0.24  0.41 0.30  0.30  0.31 0.35  0.35
Crit Moves:  ****             ****             ****
Green/Cycle: 0.52 0.52  0.52  0.39 0.39  0.39  0.33 0.33  0.33  0.33 0.33  0.33
Volume/Cap:  0.88 0.66  0.66  0.78 0.62  0.62  1.23 0.91  0.91  0.94 1.04  1.04
Delay/Veh:   37.8 12.8  12.8  66.6 21.2  21.2 198.4 39.5  39.5 107.5 66.3  66.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  37.8 12.8  12.8  66.6 21.2  21.2 198.4 39.5  39.5 107.5 66.3  66.3
DesignQueue:   14   28     2     2   24     3     4   31     6     3   40     3
********************************************************************************
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365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #23 University Avenue / Milvia Street

Cycle (sec): 75 Critical Vol./Cap. (X): 0.645
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 23.3
Optimal Cycle: 49 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	21	21	21	21	21	21	20	20	20	20	20	20
Lanes:	1 0 0 1 0			0 0 1! 0 0			0 1 0 1 0			0 1 0 1 0		
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	127	218	44	13	102	74	47	649	108	22	651	33
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	127	218	44	13	102	74	47	649	108	22	651	33
Added Vol:	0	0	0	0	0	0	0	51	0	0	356	0
Future:	10	10	10	10	10	10	20	180	20	10	80	20
Initial Fut:	137	228	54	23	112	84	67	880	128	32	1087	53
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	137	228	54	23	112	84	67	880	128	32	1087	53
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	137	228	54	23	112	84	67	880	128	32	1087	53
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	137	228	54	23	112	84	67	880	128	32	1087	53
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.70	0.97	0.97	0.90	0.90	0.90	0.67	0.67	0.67	0.85	0.85	0.85
Lanes:	1.00	0.81	0.19	0.11	0.51	0.38	0.12	1.64	0.24	0.05	1.86	0.09
Final Sat.:	1336	1492	353	180	875	656	158	2078	302	88	2992	146
Capacity Analysis Module:												
Vol/Sat:	0.10	0.15	0.15	0.13	0.13	0.13	0.42	0.42	0.42	0.36	0.36	0.36
Crit Moves:		****						****				
Green/Cycle:	0.35	0.35	0.35	0.35	0.35	0.35	0.47	0.47	0.47	0.47	0.47	0.47
Volume/Cap:	0.30	0.44	0.44	0.37	0.37	0.37	0.89	0.89	0.89	0.77	0.77	0.77
Delay/Veh:	19.5	21.1	21.1	20.1	20.1	20.1	28.5	28.5	28.5	20.1	20.1	20.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	19.5	21.1	21.1	20.1	20.1	20.1	28.5	28.5	28.5	20.1	20.1	20.1
DesignQueue:	4	6	2	1	3	2	2	21	3	1	26	1

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #24 University Avenue / SB Shattuck Avenue

Cycle (sec): 75 Critical Vol./Cap. (X): 0.933
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 23.5
Optimal Cycle: 103 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	16	16	16	16	16	16	16	16	16
Lanes:	0 0 0 0 0			0 1 1 1 0			1 0 1 1 0			0 1 0 1 1		
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	0	0	55	576	146	131	374	254	74	642	640
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	55	576	146	131	374	254	74	642	640
Added Vol:	0	0	0	0	84	50	7	28	16	4	306	5
Future:	0	0	0	33	253	33	44	110	55	11	88	143
Initial Fut:	0	0	0	88	913	229	182	512	325	89	1036	788
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	88	913	229	182	512	325	89	1036	788
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	88	913	229	182	512	325	89	1036	788
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	88	913	229	182	512	325	89	1036	788
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.77	0.77	0.77	0.17	0.81	0.81	0.68	0.68	0.68
Lanes:	0.00	0.00	0.00	0.21	2.23	0.56	1.00	1.22	0.78	0.14	1.62	1.24
Final Sat.:	0	0	0	316	3274	821	328	1872	1188	179	2084	1586
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.28	0.28	0.28	0.55	0.27	0.27	0.50	0.50	0.50
Crit Moves:					****		****					
Green/Cycle:	0.00	0.00	0.00	0.30	0.30	0.30	0.59	0.59	0.59	0.59	0.59	0.59
Volume/Cap:	0.00	0.00	0.00	0.93	0.93	0.93	0.93	0.46	0.46	0.84	0.84	0.84
Delay/Veh:	0.0	0.0	0.0	38.7	38.7	38.7	62.7	9.3	9.3	16.1	16.1	16.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	38.7	38.7	38.7	62.7	9.3	9.3	16.1	16.1	16.1
DesignQueue:	0	0	0	3	28	7	3	9	6	2	19	15

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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                             PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #25 University Avenue / NB Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.617
Loss Time (sec):     15 (Y+R =  4 sec) Average Delay (sec/veh):      18.5
Optimal Cycle:       53              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected         Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    19    0    19     0    0     0     0   13     0     0   13     0
Lanes:        2  0  1! 0  1   0  0  0  0  0   0  0  2  0  0   0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     938    0   208     0    0     0     0  454     0     0  433     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  938    0   208     0    0     0     0  454     0     0  433     0
Added Vol:    155    0    13     0    0     0     0   28     0     0  160     0
Future:       150    0    40     0    0     0     0    0     0     0   70     0
Initial Fut: 1243    0   261     0    0     0     0  482     0     0  663     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:  1243    0   261     0    0     0     0  482     0     0  663     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 1243    0   261     0    0     0     0  482     0     0  663     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:  1243    0   261     0    0     0     0  482     0     0  663     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.82 1.00  0.84  1.00 1.00  1.00  1.00 0.86  1.00  1.00 0.86  1.00
Lanes:       2.77 0.00  1.23  0.00 0.00  0.00  0.00 2.00  0.00  0.00 2.00  0.00
Final Sat.:  4290    0  1973     0    0     0     0 3249     0     0 3249     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.29 0.00  0.13  0.00 0.00  0.00  0.00 0.15  0.00  0.00 0.20  0.00
Crit Moves:  ****                              ****                   ****
Green/Cycle: 0.47 0.00  0.47  0.00 0.00  0.00  0.00 0.33  0.00  0.00 0.33  0.00
Volume/Cap:  0.62 0.00  0.28  0.00 0.00  0.00  0.00 0.45  0.00  0.00 0.62  0.00
Delay/Veh:   16.0  0.0  12.3   0.0  0.0   0.0   0.0 21.1   0.0   0.0 23.8   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  16.0  0.0  12.3   0.0  0.0   0.0   0.0 21.1   0.0   0.0 23.8   0.0
DesignQueue:   29    0     6     0    0     0     0   14     0     0   19     0
********************************************************************************
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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                             PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #26 University Avenue / Oxford Street
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.890
Loss Time (sec):      4 (Y+R =  4 sec) Average Delay (sec/veh):      30.6
Optimal Cycle:      145              Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted         Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    18   18    18    18   18    18
Lanes:        1  0  1  1  0   1  0  1  1  0   1  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     278  771    16    32  835   106   306   39   330     9   37    40
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  278  771    16    32  835   106   306   39   330     9   37    40
Added Vol:     90   75     0     0   55    76    23   -1    19    -2   -6    -2
Future:        55  143     0    11  176    33    22   11    22     0   11    11
Initial Fut:  423  989    16    43 1066   215   351   49   371     7   42    49
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   423  989    16    43 1066   215   351   49   371     7   42    49
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  423  989    16    43 1066   215   351   49   371     7   42    49
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   423  989    16    43 1066   215   351   49   371     7   42    49
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.41 0.85  0.85  0.24 0.83  0.83  0.59 0.59  0.77  0.83 0.83  0.83
Lanes:       1.00 1.97  0.03  1.00 1.66  0.34  1.75 0.25  1.00  0.07 0.43  0.50
Final Sat.:   770 3191    52   453 2636   532  1972  275  1454   112  675   787
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.55 0.31  0.31  0.09 0.40  0.40  0.18 0.18  0.26  0.06 0.06  0.06
Crit Moves:  ****                   ****                  ****
Green/Cycle: 0.68 0.68  0.68  0.42 0.42  0.42  0.26 0.26  0.26  0.26 0.26  0.26
Volume/Cap:  0.80 0.45  0.45  0.23 0.97  0.97  0.68 0.68  0.97  0.24 0.24  0.24
Delay/Veh:   30.1  6.1   6.1  16.9 40.4  40.4  31.0 31.0  66.9  23.1 23.1  23.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  30.1  6.1   6.1  16.9 40.4  40.4  31.0 31.0  66.9  23.1 23.1  23.1
DesignQueue:   14   14     0     1   28     6    11    2    12     0    1     2
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #27 Univeristy Drive (East Gate)  / Gayley Road
********************************************************************************
Average Delay (sec/veh):      2.1          Worst Case Level Of Service:        C
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign         Stop Sign
Rights:           Include          Include          Include           Include
Lanes:        1  0  1  0  0    0  0  0  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      59  552    0     0  505   52    41    0   81     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   59  552    0     0  505   52    41    0   81     0    0     0
Added Vol:     -2   90    0     0   46   -3   -19    0  -12     0    0     0
Future:        20  110    0     0   60   10    10    0   20     0    0     0
Initial Fut:   77  752    0     0  611   59    32    0   89     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    77  752    0     0  611   59    32    0   89     0    0     0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0     0
Final Vol.:    77  752    0     0  611   59    32    0   89     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  670 xxxx xxxxx  xxxx xxxx xxxxx  1547 xxxx   641  xxxx xxxx xxxxx
Potent Cap.:  930 xxxx xxxxx  xxxx xxxx xxxxx   127 xxxx   479  xxxx xxxx xxxxx
Move Cap.:    930 xxxx xxxxx  xxxx xxxx xxxxx   119 xxxx   479  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.2 xxxx xxxxx xxxxx xxxx xxxxx  46.0 xxxx  14.2 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     E    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             22.6            xxxxxx
ApproachLOS:        *                *                 C                *
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #28 Addison Street / Oxford Street
********************************************************************************
Average Delay (sec/veh):      2.6          Worst Case Level Of Service:        E
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign         Stop Sign
Rights:           Include          Include          Include           Include
Lanes:        1  0  2  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      32 1006    0     0  952   28    10    0  114     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   32 1006    0     0  952   28    10    0  114     0    0     0
Added Vol:      3  149    0     0   70    2    16    0   18     0    0     0
Future:        10  180    0     0  170   10     0    0   10     0    0     0
Initial Fut:   45 1335    0     0 1192   40    26    0  142     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    48 1420    0     0 1268   43    28    0  151     0    0     0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0     0
Final Vol.:    48 1420    0     0 1268   43    28    0  151     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  883 xxxx xxxxx  xxxx xxxx xxxxx  1671 xxxx    16  xxxx xxxx xxxxx
Potent Cap.:  586 xxxx xxxxx  xxxx xxxx xxxxx    63 xxxx   806  xxxx xxxx xxxxx
Move Cap.:    586 xxxx xxxxx  xxxx xxxx xxxxx    59 xxxx   806  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 11.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  271 xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 40.7 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    E     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             40.7            xxxxxx
ApproachLOS:        *                *                 E                *
```

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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #29 Center Street / SB Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.632
Loss Time (sec):     12 (Y+R = 10 sec) Average Delay (sec/veh):       17.4
Optimal Cycle:       67              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0   30    30    30    0    17    17   25    25     0
Lanes:       0  0  0  0  0   0  1  1  1  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0     0     0   41   790   126    0   104   179   29   160     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0     0     0   41   790   126    0   104   179   29   160     0
Added Vol:     0     0     0    0   116     0    0     0     0   -2     2     0
Future:        0     0     0   10   230    40    0    50    30   30    40     0
Initial Fut:   0     0     0   51  1136   166    0   154   209   57   202     0
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Volume:    0     0     0   51  1136   166    0   154   209   57   202     0
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0     0     0   51  1136   166    0   154   209   57   202     0
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Final Vol.:    0     0     0   51  1136   166    0   154   209   57   202     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900  1900
Adjustment:  1.00  1.00  1.00 0.79  0.79  0.79 1.00  0.83  0.83 0.79  0.79  1.00
Lanes:       0.00  0.00  0.00 0.11  2.52  0.37 0.00  0.42  0.58 0.22  0.78  0.00
Final Sat.:    0     0     0  170  3780   552    0   669   908  329  1164     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.30  0.30  0.30 0.00  0.23  0.23 0.17  0.17  0.00
Crit Moves:                         ****              ****
Green/Cycle: 0.00  0.00  0.00 0.40  0.40  0.40 0.00  0.29  0.29 0.43  0.43  0.00
Volume/Cap:  0.00  0.00  0.00 0.75  0.75  0.75 0.00  0.78  0.78 0.41  0.41  0.00
Delay/Veh:    0.0   0.0   0.0 13.7  13.7  13.7  0.0  36.9  36.9  9.4   9.4   0.0
User DelAdj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
AdjDel/Veh:   0.0   0.0   0.0 13.7  13.7  13.7  0.0  36.9  36.9  9.4   9.4   0.0
DesignQueue:   0     0     0    1    30     4    0     5     6    1     5     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #30 Center Street / NB Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.551
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        9.5
Optimal Cycle:       65              Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   40    40    40    0     0     0   17    17     0    0    17    17
Lanes:       0  1  1  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     50   982    86    0     0     0   81    55     0    0   139    58
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:  50   982    86    0     0     0   81    55     0    0   139    58
Added Vol:     0   118     0    0     0     0    0     0     0    0     0     0
Future:       30   110    30    0     0     0   30    40     0    0    40    60
Initial Fut:  80  1210   116    0     0     0  111    95     0    0   179   118
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Volume:   80  1210   116    0     0     0  111    95     0    0   179   118
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:  80  1210   116    0     0     0  111    95     0    0   179   118
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Final Vol.:   80  1210   116    0     0     0  111    95     0    0   179   118
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900  1900
Adjustment:  0.80  0.80  0.80 1.00  1.00  1.00 0.74  0.74  1.00 1.00  0.85  0.85
Lanes:       0.17  2.58  0.25 0.00  0.00  0.00 0.54  0.46  0.00 0.00  0.60  0.40
Final Sat.:  259  3922   376    0     0     0  754   645     0    0   975   643
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.31  0.31  0.31 0.00  0.00  0.00 0.15  0.15  0.00 0.00  0.18  0.18
Crit Moves:        ****                                                ****
Green/Cycle: 0.53  0.53  0.53 0.00  0.00  0.00 0.29  0.29  0.00 0.00  0.29  0.29
Volume/Cap:  0.58  0.58  0.58 0.00  0.00  0.00 0.50  0.50  0.00 0.00  0.63  0.63
Delay/Veh:    3.8   3.8   3.8  0.0   0.0   0.0 20.2  20.2   0.0  0.0  29.1  29.1
User DelAdj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
AdjDel/Veh:   3.8   3.8   3.8  0.0   0.0   0.0 20.2  20.2   0.0  0.0  29.1  29.1
DesignQueue:   2    25     2    0     0     0    3     3     0    0     5     4
********************************************************************************
```

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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #31 Center Street / Oxford Street
********************************************************************************
Cycle (sec):          75               Critical Vol./Cap. (X):        0.550
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       10.5
Optimal Cycle:        46               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   19   19    19   19   19    19   19   19    19   19   19    19
Lanes:       1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2000 << 4:00 - 6:00 PM
Base Vol:      87  998    24   19  980    67   33    6    84   37    9    16
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   87  998    24   19  980    67   33    6    84   37    9    16
Added Vol:      0  156     0   -1   85     3    0    0     0   -2   -3    -5
Future:        40  150    10    0  150    30   30    0    30    0    0     0
Initial Fut:  127 1304    34   18 1215   100   63    6   114   35    6    11
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   127 1304    34   18 1215   100   63    6   114   35    6    11
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  127 1304    34   18 1215   100   63    6   114   35    6    11
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   127 1304    34   18 1215   100   63    6   114   35    6    11
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.19 0.95  0.95 0.18 0.94  0.94 0.81 0.81  0.81 0.76 0.76  0.76
Lanes:       1.00 1.95  0.05 1.00 1.85  0.15 0.34 0.03  0.63 0.67 0.12  0.21
Final Sat.:   359 3504    91  348 3299   272  527   50   954  977  168   307
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.35 0.37  0.37 0.05 0.37  0.37 0.12 0.12  0.12 0.04 0.04  0.04
Crit Moves:       ****                           ****
Green/Cycle: 0.64 0.64  0.64 0.64 0.64  0.64 0.25 0.25  0.25 0.25 0.25  0.25
Volume/Cap:  0.55 0.58  0.58 0.08 0.58  0.58 0.47 0.47  0.47 0.14 0.14  0.14
Delay/Veh:   16.8  8.8   8.8  5.8  8.8   8.8 27.8 27.8  27.8 22.5 22.5  22.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  16.8  8.8   8.8  5.8  8.8   8.8 27.8 27.8  27.8 22.5 22.5  22.5
DesignQueue:    2   22     1    0   20     2    2    0     4    1    0     0
********************************************************************************
```



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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #32 Stadium Rim Road / Gayley Road
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap. (X):        1.274
Loss Time (sec):       0 (Y+R =  4 sec) Average Delay (sec/veh):       92.7
Optimal Cycle:         0               Level Of Service:                 F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  0  1  0   0  1  0  0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  359    19  135  459     0   20    7    15   47    0   232
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  359    19  135  459     0   20    7    15   47    0   232
Added Vol:      0   55    22    6   29     0    0    0     0   30    0    33
Future:         0   99    11   22   55     0    0    0     0   11    0    33
Initial Fut:    0  513    52  163  543     0   20    7    15   88    0   298
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0  513    52  163  543     0   20    7    15   88    0   298
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0  513    52  163  543     0   20    7    15   88    0   298
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0  513    52  163  543     0   20    7    15   88    0   298
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.91  0.09 0.23 0.77  0.00 0.47 0.17  0.36 0.23 0.00  0.77
Final Sat.:     0  511    52  128  426     0  194   68   145  123    0   417
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 1.00  1.00 1.27 1.27  xxxx 0.10 0.10  0.10 0.71 xxxx  0.71
Crit Moves:       ****            ****        ****             ****
Delay/Veh:    0.0 63.9  63.9 157.8  158  0.0 12.3 12.3  12.3 24.5  0.0  24.5
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 63.9  63.9 157.8  158  0.0 12.3 12.3  12.3 24.5  0.0  24.5
LOS by Move:    *    F     F    F    F     *    B    B     B    C    *     C
ApproachDel:       63.9            157.8             12.3             24.5
Delay Adj:         1.00             1.00             1.00             1.00
ApprAdjDel:        63.9            157.8             12.3             24.5
LOS by Appr:         F                F                B                C
********************************************************************************
```

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #33 Allston Way / Oxford Street
********************************************************************************
Average Delay (sec/veh):      2.8          Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  1  0  0    0  1  0  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      46 1002     0    26 1082    75    23     0   110     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   46 1002     0    26 1082    75    23     0   110     0     0     0
Added Vol:      0  156     0     0   83     0     0     0     0     0     0     0
Future:         0  190     0    10  160    10     0     0    30     0     0     0
Initial Fut:   46 1348     0    36 1325    85    23     0   140     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    46 1348     0    36 1325    85    23     0   140     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Final Vol.:    46 1348     0    36 1325    85    23     0   140     0     0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1296 xxxx xxxxx  1348 xxxx xxxxx  2147 xxxx   549  xxxx xxxx xxxxx
Potent Cap.:  511 xxxx xxxxx   517 xxxx xxxxx    40 xxxx   457  xxxx xxxx xxxxx
Move Cap.:    511 xxxx xxxxx   517 xxxx xxxxx    35 xxxx   457  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 12.7 xxxx xxxxx  12.5 xxxx xxxxx 219.9 xxxx  16.3 xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     F    *     C     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 12.7 xxxx xxxxx  12.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             45.0            xxxxxx
ApproachLOS:        *                *                E                 *
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #34 Kittridge Street / Oxford Street / Fulton Street
********************************************************************************
Average Delay (sec/veh): OVERFLOW          Worst Case Level Of Service:       F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  1  0    0  1  0  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      45  995     0     0 1108    96    51     0    69     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   45  995     0     0 1108    96    51     0    69     0     0     0
Added Vol:      0   94     3     9   74     0     0     3     0    18    26    62
Future:        20  180     0     0  150    30    10     0    20     0     0     0
Initial Fut:   65 1269     3     9 1332   126    61     3    89    18    26    62
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    65 1269     3     9 1332   126    61     3    89    18    26    62
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Final Vol.:    65 1269     3     9 1332   126    61     3    89    18    26    62
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.5  6.5   6.9   7.5  6.5   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1357 xxxx xxxxx  1272 xxxx xxxxx  2136 2795   588  2026 2860   636
Potent Cap.:  487 xxxx xxxxx   553 xxxx xxxxx    27   18   434    33   16   425
Move Cap.:    487 xxxx xxxxx   553 xxxx xxxxx     0   15   434    20   14   425
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 13.5 xxxx xxxxx  11.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx   36 xxxxx
Shrd StpDel: 13.5 xxxx xxxxx  11.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx 1122 xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            1122.1
ApproachLOS:        *                *                F                 F
```

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---------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
---------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
*********************************************************************************
Intersection #35 Stadium Rim Road / Centennial Drive
*********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.629
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       13.1
Optimal Cycle:        0               Level Of Service:                 B
*********************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       0  0  0  1  0    0  1  0  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    99   140   102    57     0     0     0     0   204     0   146
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   0    99   140   102    57     0     0     0     0   204     0   146
Added Vol:     0     0     0    27     0     0     0     0     0     0     0    63
Future:        0    22    22    22    11     0     0     0     0    11     0    22
Initial Fut:   0   121   162   151    68     0     0     0     0   215     0   231
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:    0   121   162   151    68     0     0     0     0   215     0   231
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   0   121   162   151    68     0     0     0     0   215     0   231
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Final Vol.:    0   121   162   151    68     0     0     0     0   215     0   231
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.00  0.43  0.57  0.69  0.31  0.00  0.00  0.00  0.00  0.48  0.00  0.52
Final Sat.:    0   290   389   422   190     0     0     0     0   342     0   367
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx  0.42  0.42  0.36  0.36  xxxx  xxxx  xxxx  xxxx  0.63  xxxx  0.63
Crit Moves:              ****        ****                          ****
Delay/Veh:    0.0  11.2  11.2  11.3  11.3   0.0   0.0   0.0   0.0  15.2   0.0  15.2
Delay Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:   0.0  11.2  11.2  11.3  11.3   0.0   0.0   0.0   0.0  15.2   0.0  15.2
LOS by Move:   *     B     B     B     B     *     *     *     *     C     *     C
ApproachDel:       11.2              11.3            xxxxxx              15.2
Delay Adj:         1.00              1.00             xxxxx              1.00
ApprAdjDel:        11.2              11.3            xxxxxx              15.2
LOS by Appr:         B                 B                *                  C
*********************************************************************************
```



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---------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
---------------------------------------------------------------------------------
                        Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #36 Bancroft Way / Shattuck Avenue
*********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.841
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       22.3
Optimal Cycle:       69               Level Of Service:                 C
*********************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   18    18     0    0    18    18    0     0     0   16    16    16
Lanes:       1  0  2  0  0    0  0  1  1  0    0  0  1! 0  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     30  1186     0     0   949    23     1     0    38   258    97   111
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  30  1186     0     0   949    23     1     0    38   258    97   111
Added Vol:     0    45     0     0   140     0     0     0     0   109     0    76
Future:       10   150     0     0   290    10     0     0     0    30    20    20
Initial Fut:  40  1381     0     0  1379    33     1     0    38   397   117   207
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:   40  1381     0     0  1379    33     1     0    38   397   117   207
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  40  1381     0     0  1379    33     1     0    38   397   117   207
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Final Vol.:   40  1381     0     0  1379    33     1     0    38   397   117   207
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment:  0.13  0.86  1.00  1.00  0.85  0.85  0.78  1.00  0.78  0.66  0.81  0.81
Lanes:       1.00  2.00  0.00  0.00  1.95  0.05  0.03  0.00  0.97  1.00  0.36  0.64
Final Sat.:   245  3249     0     0  3164    76    38     0  1438  1259   558   988
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16  0.43  0.00  0.00  0.44  0.44  0.03  0.00  0.03  0.32  0.21  0.21
Crit Moves:                          ****                          ****
Green/Cycle: 0.52  0.52  0.00  0.00  0.52  0.52  0.38  0.00  0.38  0.38  0.38  0.38
Volume/Cap:  0.32  0.82  0.00  0.00  0.84  0.84  0.07  0.00  0.07  0.84  0.56  0.56
Delay/Veh:   16.8  19.7   0.0   0.0  20.7  20.7  15.3   0.0  15.3  37.8  22.4  22.4
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:  16.8  19.7   0.0   0.0  20.7  20.7  15.3   0.0  15.3  37.8  22.4  22.4
DesignQueue:    1    31     0     0    31     1     0     0     1    11     3     6
*********************************************************************************
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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #37 Bancroft Way / Fulton Street
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.508
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      10.3
Optimal Cycle:       49              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted         Permitted         Permitted         Permitted
Rights:          Include           Include           Include           Ignore
Min. Green:    17   17    0     0   17    17     0    0     0    24   24    24
Lanes:        0  1  1  0  0   0  0  2  1  0   0  0  0  0  0   0  1  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      18  164     0     0 1066   165     0    0     0    12  287   898
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   18  164     0     0 1066   165     0    0     0    12  287   898
Added Vol:      2    0     0     0   85     7     0    0     0    20  144    97
Future:        10   10     0     0  130    20     0    0     0    10   30   170
Initial Fut:   30  174     0     0 1281   192     0    0     0    42  461  1165
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
PHF Volume:    30  174     0     0 1281   192     0    0     0    42  461     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   30  174     0     0 1281   192     0    0     0    42  461     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  0.00
Final Vol.:    30  174     0     0 1281   192     0    0     0    42  461     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.73 0.73  1.00  1.00 0.89  0.89  1.00 1.00  1.00  0.81 0.81  1.00
Lanes:       0.29 1.71  0.00  0.00 2.61  0.39  0.00 0.00  0.00  0.17 1.83  1.00
Final Sat.:   408 2365     0     0 4425   663     0    0     0   256 2812  1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.07  0.00  0.00 0.29  0.29  0.00 0.00  0.00  0.16 0.16  0.00
Crit Moves:                        ****                              ****
Green/Cycle: 0.57 0.57  0.00  0.00 0.57  0.57  0.00 0.00  0.00  0.32 0.32  0.00
Volume/Cap:  0.13 0.13  0.00  0.00 0.51  0.51  0.00 0.00  0.00  0.51 0.51  0.00
Delay/Veh:    5.0  5.0   0.0   0.0  6.9   6.9   0.0  0.0   0.0  22.4 22.4   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   5.0  5.0   0.0   0.0  6.9   6.9   0.0  0.0   0.0  22.4 22.4   0.0
DesignQueue:    1    3     0     0   25     4     0    0     0     1   13     0
********************************************************************************
```



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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #38 Bancroft Way / Ellsworth Street
********************************************************************************
Average Delay (sec/veh):     10.0         Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign         Stop Sign        Uncontrolled      Uncontrolled
Rights:          Include           Include           Include           Include
Lanes:        1  1  0  0  0   0  0  0  0  1   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     348   11     0     0    0   100     0    0     0     0  877     6
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  348   11     0     0    0   100     0    0     0     0  877     6
Added Vol:     12    0     0     0    0     0     0    0     0     0  158     0
Future:        50    0     0     0    0     0     0    0     0     0  230     0
Initial Fut:  410   11     0     0    0   100     0    0     0     0 1265     6
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   410   11     0     0    0   100     0    0     0     0 1265     6
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   410   11     0     0    0   100     0    0     0     0 1265     6
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  633 1271 xxxxx  xxxx xxxx   636  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  396  169 xxxxx  xxxx xxxx   482  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    313  169 xxxxx  xxxx xxxx   482  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 35.8 xxxx xxxxx xxxxx xxxx  14.4 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    E    *     *     *    *     B     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:  300 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 42.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     E    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:      39.2             14.4            xxxxxx            xxxxxx
ApproachLOS:        E                B                *                 *
```

```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #39 Bancroft Way / Dana Street
********************************************************************************
Average Delay (sec/veh):      0.0          Worst Case Level Of Service:       A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  1  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:        0    0     0     0    0     0     0    0     0   282  873     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0     0    0     0     0    0     0   282  873     0
Added Vol:       0    0     0     0    0     0     0    0     0    32  158     0
Future:          0    0     0     0    0     0     0    0     0    50  230     0
Initial Fut:     0    0     0     0    0     0     0    0     0   364 1261     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0     0    0     0     0    0     0   364 1261     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0     0    0     0     0    0     0   364 1261     0
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        *                *                *                *
```



```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #40 Bancroft Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.414
Loss Time (sec):      8 (Y+R = 22 sec) Average Delay (sec/veh):       19.3
Optimal Cycle:       58               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     29    0     0     0    0     0     0    0     0     0   21     0
Lanes:        2  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      495    0     0     0    0     0     0    0     0     0  675     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   495    0     0     0    0     0     0    0     0     0  675     0
Added Vol:       3    0     0     0    0     0     0    0     0     0  157     0
Future:        130    0     0     0    0     0     0    0     0     0  140     0
Initial Fut:   628    0     0     0    0     0     0    0     0     0  972     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    628    0     0     0    0     0     0    0     0     0  972     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   628    0     0     0    0     0     0    0     0     0  972     0
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    628    0     0     0    0     0     0    0     0     0  972     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.92 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.91  1.00
Lanes:        2.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 3.00  0.00
Final Sat.:   3502    0     0     0    0     0     0    0     0     0 5187     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.18 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.19  0.00
Crit Moves:   ****                                                    ****
Green/Cycle:  0.42 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.30  0.00
Volume/Cap:   0.43 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.62  0.00
Delay/Veh:    13.6  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 23.0   0.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   13.6  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 23.0   0.0
DesignQueue:    15    0     0     0    0     0     0    0     0     0   28     0
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #41 Bancroft Way / Bowditch Street

Cycle (sec): 100 Critical Vol./Cap. (X): 0.670
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 16.2
Optimal Cycle: 0 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 0 0 0			0 0 0 0 0			0 0 0 0 0			0 1 1 0 0		
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	191	0	0	0	0	0	0	0	0	99	494	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	191	0	0	0	0	0	0	0	0	99	494	0
Added Vol:	0	0	0	0	0	0	0	0	0	27	157	0
Future:	30	0	0	0	0	0	0	0	0	20	110	0
Initial Fut:	221	0	0	0	0	0	0	0	0	146	761	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	221	0	0	0	0	0	0	0	0	146	761	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	221	0	0	0	0	0	0	0	0	146	761	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	221	0	0	0	0	0	0	0	0	146	761	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	1.68	0.00
Final Sat.:	617	0	0	0	0	0	0	0	0	218	1158	0
Capacity Analysis Module:												
Vol/Sat:	0.36	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.67	0.66	xxxx
Crit Moves:	****									****		
Delay/Veh:	11.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9	17.2	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9	17.2	0.0
LOS by Move:	B	*	*	*	*	*	*	*	*	C	C	*
ApproachDel:		11.7			xxxxxx			xxxxxx			17.3	
Delay Adj:		1.00			xxxxx			xxxxx			1.00	
ApprAdjDel:		11.7			xxxxxx			xxxxxx			17.3	
LOS by Appr:		B			*			*			C	

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #42 Bancroft Way / College Avenue

Cycle (sec): 100 Critical Vol./Cap. (X): 0.717
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 15.9
Optimal Cycle: 0 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 0 0 0			0 0 0 0 0			0 0 0 0 0			0 1 1 0 0		
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	371	0	0	0	0	0	0	0	0	83	226	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	371	0	0	0	0	0	0	0	0	83	226	0
Added Vol:	20	0	0	0	0	0	0	0	0	23	42	0
Future:	110	0	0	0	0	0	0	0	0	0	22	0
Initial Fut:	501	0	0	0	0	0	0	0	0	106	290	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	501	0	0	0	0	0	0	0	0	106	290	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	501	0	0	0	0	0	0	0	0	106	290	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	501	0	0	0	0	0	0	0	0	106	290	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	1.46	0.00
Final Sat.:	699	0	0	0	0	0	0	0	0	309	870	0
Capacity Analysis Module:												
Vol/Sat:	0.72	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.34	0.33	xxxx
Crit Moves:	****									****		
Delay/Veh:	19.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	11.3	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	19.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	11.3	0.0
LOS by Move:	C	*	*	*	*	*	*	*	*	B	B	*
ApproachDel:		19.4			xxxxxx			xxxxxx			11.4	
Delay Adj:		1.00			xxxxx			xxxxx			1.00	
ApprAdjDel:		19.4			xxxxxx			xxxxxx			11.4	
LOS by Appr:		C			*			*			B	

```
-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM 4-Way Stop Method (Future Volume Alternative)
*******************************************************************************
Intersection #43 Bancroft Way / Piedmont Avenue
*******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.998
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       39.8
Optimal Cycle:        0              Level Of Service:                  E
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     152  439    0    0  357  159    0    0    0    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  152  439    0    0  357  159    0    0    0    0    0    0
Added Vol:     13   67    0    0   39   52    0    0    0    0    0    0
Future:        11   99    0    0   44   11    0    0    0    0    0    0
Initial Fut:  176  605    0    0  440  222    0    0    0    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   176  605    0    0  440  222    0    0    0    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  176  605    0    0  440  222    0    0    0    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   176  605    0    0  440  222    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.23 0.77 0.00 0.00 0.66 0.34 0.00 0.00 0.00 0.00 0.00 0.00
Final Sat.:   176  607    0    0  533  269    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     1.00 1.00 xxxx xxxx 0.83 0.83 xxxx xxxx xxxx xxxx xxxx xxxx
Crit Moves:       ****                **** 
Delay/Veh:   52.5 52.5  0.0  0.0 24.9 24.9  0.0  0.0  0.0  0.0  0.0  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  52.5 52.5  0.0  0.0 24.9 24.9  0.0  0.0  0.0  0.0  0.0  0.0
LOS by Move:    F    F    *    *    C    C    *    *    *    *    *    *
ApproachDel:      52.5             24.9            xxxxxx           xxxxxx
Delay Adj:        1.00             1.00             xxxxx            xxxxx
ApprAdjDel:       52.5             24.9            xxxxxx           xxxxxx
LOS by Appr:        F                C                *                *
*******************************************************************************
```



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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                              PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #44 Durant Avenue / Shattuck Avenue
*******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.816
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       23.7
Optimal Cycle:       73              Level Of Service:                  C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    19   19   19   19   19   19    0    0    0    0    0    0
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      69 1216  120   88 1099   51    9   72   55    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   69 1216  120   88 1099   51    9   72   55    0    0    0
Added Vol:      0   45   13   15  234    0    0    0    0    0    0    0
Future:        11  187   66   66  286   11    0   44   11    0    0    0
Initial Fut:   80 1448  199  169 1619   62    9  116   66    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    80 1448  199  169 1619   62    9  116   66    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   80 1448  199  169 1619   62    9  116   66    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    80 1448  199  169 1619   62    9  116   66    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  0.13 0.84 0.84 0.86 0.85 0.85 0.77 0.77 0.77 1.00 1.00 1.00
Lanes:       1.00 1.76 0.24 1.00 1.93 0.07 0.09 1.22 0.69 0.00 0.00 0.00
Final Sat.:   246 2805  385 1625 3110  119  138 1773 1009    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.32 0.52 0.52 0.10 0.52 0.52 0.07 0.07 0.07 0.00 0.00 0.00
Crit Moves:       ****      ****                ****
Green/Cycle: 0.49 0.49 0.49 0.64 0.64 0.64 0.20 0.20 0.20 0.00 0.00 0.00
Volume/Cap:  0.66 1.05 1.05 0.16 0.81 0.81 0.33 0.33 0.33 0.00 0.00 0.00
Delay/Veh:   30.4 45.2 45.2  5.8  3.6  3.6 27.2 27.2 27.2  0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  30.4 45.2 45.2  5.8  3.6  3.6 27.2 27.2 27.2  0.0  0.0  0.0
DesignQueue:    2   35    5    3   27    1    0    4    2    0    0    0
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                             PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #45 Durant Avenue / Fulton Street
********************************************************************************
Cycle (sec):        75              Critical Vol./Cap. (X):        0.454
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):       9.9
Optimal Cycle:      51              Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0   21   21     0   22   22    22    0    0     0
Lanes:        0  0  0  0  0   1  1  1  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0  527  760     0  137  219    33    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0  527  760     0  137  219    33    0    0     0
Added Vol:      0    0     0   86   20     0    2   27     0    0    0     0
Future:         0    0     0   70   90     0   20  110    30    0    0     0
Initial Fut:    0    0     0  683  870     0  159  356    63    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0  683  870     0  159  356    63    0    0     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  683  870     0  159  356    63    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0    0     0  683  870     0  159  356    63    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.95 0.95  1.00 0.98 0.93  0.93 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 1.32 1.68  0.00 1.00 1.70  0.30 0.00 0.00  0.00
Final Sat.:     0    0     0 2381 3034     0 1858 3000   531    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.29 0.29  0.00 0.09 0.12  0.12 0.00 0.00  0.00
Crit Moves:                       ****             ****
Green/Cycle: 0.00 0.00  0.00 0.60 0.60  0.00 0.29 0.29  0.29 0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.00 0.48 0.48  0.00 0.29 0.40  0.40 0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0  5.3  5.3   0.0 21.8 22.4  22.4  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  5.3  5.3   0.0 21.8 22.4  22.4  0.0  0.0   0.0
DesignQueue:    0    0     0   12   16     0    5   11     2    0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                             PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #46 Durant Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):        70              Critical Vol./Cap. (X):        0.459
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):      13.3
Optimal Cycle:      43              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0   18    18    0    0     0   17   17     0    0    0     0
Lanes:        0  0  1  1  0   0  0  0  0  0   0  1  2  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  362   119    0    0     0  202  690     0    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  362   119    0    0     0  202  690     0    0    0     0
Added Vol:      0    1     6    0    0     0    2  100     0    0    0     0
Future:         0  110    30    0    0     0   20  160     0    0    0     0
Initial Fut:    0  473   155    0    0     0  224  950     0    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0  473   155    0    0     0  224  950     0    0    0     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0  473   155    0    0     0  224  950     0    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0  473   155    0    0     0  224  950     0    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.91  0.91 1.00 1.00  1.00 0.91 0.91  1.00 1.00 1.00  1.00
Lanes:       0.00 1.51  0.49 0.00 0.00  0.00 0.57 2.43  0.00 0.00 0.00  0.00
Final Sat.:     0 2618   858    0    0     0  990 4197     0    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.18 0.00 0.00  0.00 0.23 0.23  0.00 0.00 0.00  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.00 0.39  0.39 0.00 0.00  0.00 0.49 0.49  0.00 0.00 0.00  0.00
Volume/Cap:  0.00 0.46  0.46 0.00 0.00  0.00 0.46 0.46  0.00 0.00 0.00  0.00
Delay/Veh:    0.0 15.3  15.3  0.0  0.0   0.0 12.2 12.2   0.0  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 15.3  15.3  0.0  0.0   0.0 12.2 12.2   0.0  0.0  0.0   0.0
DesignQueue:    0   12     4    0    0     0    5   20     0    0    0     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
   Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #47 Durant Avenue / College Avenue
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.435
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       13.7
Optimal Cycle:       42              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   18    18    0    0     0   16   16    16    0    0     0
Lanes:       0  0  0  1  0   0  1  0  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  189    62   16   56     0  127  268   202    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  189    62   16   56     0  127  268   202    0    0     0
Added Vol:     0    4     6    0   23     0   16   96    18    0    0     0
Future:        0   44    22    0    0     0   66   77    44    0    0     0
Initial Fut:   0  237    90   16   79     0  209  441   264    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  237    90   16   79     0  209  441   264    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  237    90   16   79     0  209  441   264    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  237    90   16   79     0  209  441   264    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.96  0.96 0.93 0.93  1.00 0.94 0.90  0.90 1.00 1.00  1.00
Lanes:       0.00 0.72  0.28 0.17 0.83  0.00 1.00 1.25  0.75 0.00 0.00  0.00
Final Sat.:    0 1326   504  299 1476     0 1794 2132  1276    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.18 0.05 0.05  0.00 0.12 0.21  0.21 0.00 0.00  0.00
Crit Moves:       ****                            ****
Green/Cycle: 0.00 0.41  0.41 0.41 0.41  0.00 0.48 0.48  0.48 0.00 0.00  0.00
Volume/Cap:  0.00 0.44  0.44 0.13 0.13  0.00 0.25 0.44  0.44 0.00 0.00  0.00
Delay/Veh:    0.0 16.6  16.6 13.2 13.2   0.0 11.6 13.0  13.0  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 16.6  16.6 13.2 13.2   0.0 11.6 13.0  13.0  0.0  0.0   0.0
DesignQueue:   0    6     2    0    2     0    4    9     6    0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
   Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #48 Durant Avenue / Piedmont Avenue
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.939
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       36.8
Optimal Cycle:        0              Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1  0  0   0  0  1  0  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  398     0    0  427     0  179    0   197    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  398     0    0  427     0  179    0   197    0    0     0
Added Vol:     0   57     0    0   39     0   23    0    79    0    0     0
Future:        0   77     0    0   55     0   44    0    44    0    0     0
Initial Fut:   0  532     0    0  521     0  246    0   320    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  532     0    0  521     0  246    0   320    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  532     0    0  521     0  246    0   320    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  532     0    0  521     0  246    0   320    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 1.00  0.00 0.00 1.00  0.00 1.00 0.00  1.00 0.00 0.00  0.00
Final Sat.:    0  567     0    0  564     0  460    0   541    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.94  xxxx xxxx 0.92  xxxx 0.53 xxxx  0.59 xxxx xxxx  xxxx
Crit Moves:       ****             ****                 ****
Delay/Veh:    0.0 48.4   0.0  0.0 45.4   0.0 18.5  0.0  17.7  0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 48.4   0.0  0.0 45.4   0.0 18.5  0.0  17.7  0.0  0.0   0.0
LOS by Move:   *    E     *    *    E     *    C    *     C    *    *     *
ApproachDel:      48.4             45.4             18.1           xxxxxx
Delay Adj:        1.00             1.00             1.00            xxxxx
ApprAdjDel:       48.4             45.4             18.1           xxxxxx
LOS by Appr:        E                E                C                *
********************************************************************************
```

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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               PM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #49 Channing Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.800
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        9.2
Optimal Cycle:       60              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    16   16    16    16   16    16    22   22    22    22   22    22
Lanes:        1  0  1  1  0    1  0  1  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      83 1279    94    19 1089    49    18   76    81   144   97   106
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   83 1279    94    19 1089    49    18   76    81   144   97   106
Added Vol:      0   32     6     0  234     0     0    0     0    24    0    26
Future:        10  180    20    50  110    90    30   80    20    30   20    30
Initial Fut:   93 1491   120    69 1433   139    48  156   101   198  117   162
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    93 1491   120    69 1433   139    48  156   101   198  117   162
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   93 1491   120    69 1433   139    48  156   101   198  117   162
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    93 1491   120    69 1433   139    48  156   101   198  117   162
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  0.09 0.94  0.94  0.96 0.96  0.96  0.95 0.95  0.95
Lanes:       1.00 1.85  0.15  1.00 1.82  0.18  0.16 0.51  0.33  0.41 0.25  0.34
Final Sat.:  1900 3304   266   171 3248   315   286  928   601   752  445   616
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.45  0.45  0.40 0.44  0.44  0.17 0.17  0.17  0.26 0.26  0.26
Crit Moves:       ****                                                ****
Green/Cycle: 0.56 0.56  0.56  0.59 0.59  0.59  0.33 0.33  0.33  0.33 0.33  0.33
Volume/Cap:  0.09 0.80  0.80  0.68 0.74  0.74  0.51 0.51  0.51  0.80 0.80  0.80
Delay/Veh:    1.2  5.2   5.2  31.3  2.7   2.7  23.4 23.4  23.4  33.7 33.7  33.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   1.2  5.2   5.2  31.3  2.7   2.7  23.4 23.4  23.4  33.7 33.7  33.7
DesignQueue:    2   30     2     1   27     3     1    5     3     6    3     5
********************************************************************************
```



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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               PM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #50 Channing Way / Fulton Street
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.842
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       27.6
Optimal Cycle:        0              Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  0  0  0    0  1  0  1  0    0  0  0  1  0    0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0    48  686    61     0  133    38    15  257     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    48  686    61     0  133    38    15  257     0
Added Vol:      0    0     0     4   16     0     0    6     0     0   50     0
Future:         0    0     0    10  100     0     0  110    30    10   70     0
Initial Fut:    0    0     0    62  802    61     0  249    68    25  377     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    62  802    61     0  249    68    25  377     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0    62  802    61     0  249    68    25  377     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    0     0    62  802    61     0  249    68    25  377     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 0.00  0.00  0.13 1.74  0.13  0.00 0.79  0.21  0.06 0.94  0.00
Final Sat.:     0    0     0    74  964    74     0  439   120    35  528     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx  0.84 0.83  0.82  xxxx 0.57  0.57  0.71 0.71  xxxx
Crit Moves:                   ****                  ****              ****
Delay/Veh:    0.0  0.0   0.0  34.6 33.2  31.8   0.0 17.0  17.0  23.0 23.0   0.0
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  34.6 33.2  31.8   0.0 17.0  17.0  23.0 23.0   0.0
LOS by Move:    *    *     *     D    D     D     *    C     C     C    C     *
ApproachDel:     xxxxxx            33.2             17.0             23.0
Delay Adj:        xxxxx            1.00             1.00             1.00
ApprAdjDel:      xxxxxx            33.2             17.0             23.0
LOS by Appr:        *                D                C                C
********************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #51 Channing Way / Telegraph Avenue
********************************************************************************
Cycle (sec):          70              Critical Vol./Cap. (X):     OVERFLOW
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       16.4
Optimal Cycle:       180              Level Of Service:                  B
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   18   18    18     0    0     0    17   17     0     0   17    17
Lanes:       0  1  0  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Sep 1997 << 4:00 - 6:00 PM
Base Vol:     86  410    41     0    0     0    23  144     0     0  227    46
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  86  410    41     0    0     0    23  144     0     0  227    46
Added Vol:     0    4     9     0    0     0     0   14     0     0   50     3
Future:       10   40    30     0    0     0     0   30    80    40   30     0
Initial Fut:  96  454    80     0    0     0    23  188    80    40  307    49
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   96  454    80     0    0     0    23  188    80    40  307    49
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  96  454    80     0    0     0    23  188    80    40  307    49
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   96  454    80     0    0     0    23  188    80    40  307    49
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.91 0.91  0.91  1.00 1.00  1.00  0.95 0.95  0.96  0.74 0.98  0.98
Lanes:       0.30 1.45  0.25  0.00 0.00  0.00  0.11 0.89  0.00  0.00 0.86  0.14
Final Sat.:   529 2504   441     0    0     0   196 1603     0     0 1611   257
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.18  0.18  0.00 0.00  0.00  0.12 0.12  xxxx  xxxx 0.19  0.19
Crit Moves:       ****                                          ****
Green/Cycle: 0.26 0.26  0.26  0.00 0.00  0.00  0.63 0.63  0.63  0.63 0.63  0.63
Volume/Cap:  0.71 0.71  0.71  0.00 0.00  0.00  0.19 0.19  xxxx  xxxx 0.30  0.30
Delay/Veh:   28.7 28.7  28.7   0.0  0.0   0.0   5.8  5.8   0.0   0.0  6.6   6.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  28.7 28.7  28.7   0.0  0.0   0.0   5.8  5.8   0.0   0.0  6.6   6.6
DesignQueue:    3   14     2     0    0     0     0    3     0     0    5     1
********************************************************************************
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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #52 Channing Way / College Avenue
********************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):        0.616
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       15.9
Optimal Cycle:        43              Level Of Service:                  B
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   18   18    18    18   18    18    17   17    17    17   17    17
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     31  189    41     7  206    24     5   95    58   124  141    47
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  31  189    41     7  206    24     5   95    58   124  141    47
Added Vol:     3    9    -1     0   41     0     0   78    20    -3   13     0
Future:       30   60    30     0   40    10    30   40    40    40   20    30
Initial Fut:  64  258    70     7  287    34    35  213   118   161  174    77
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   64  258    70     7  287    34    35  213   118   161  174    77
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  64  258    70     7  287    34    35  213   118   161  174    77
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   64  258    70     7  287    34    35  213   118   161  174    77
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.87 0.87  0.87  0.98 0.98  0.98  0.90 0.90  0.90  0.71 0.71  0.71
Lanes:       0.16 0.66  0.18  0.02 0.88  0.10  0.10 0.58  0.32  0.39 0.42  0.19
Final Sat.:   271 1094   297    40 1626   193   164  997   552   530  573   253
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.24  0.24  0.18 0.18  0.18  0.21 0.21  0.21  0.30 0.30  0.30
Crit Moves:       ****                                               ****
Green/Cycle: 0.38 0.38  0.38  0.38 0.38  0.38  0.49 0.49  0.49  0.49 0.49  0.49
Volume/Cap:  0.62 0.62  0.62  0.46 0.46  0.46  0.43 0.43  0.43  0.62 0.62  0.62
Delay/Veh:   19.2 19.2  19.2  15.8 15.8  15.8  12.2 12.2  12.2  16.2 16.2  16.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  19.2 19.2  19.2  15.8 15.8  15.8  12.2 12.2  12.2  16.2 16.2  16.2
DesignQueue:    2    6     2     0    7     1     1    4     2     3    3     1
********************************************************************************
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365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #53 Haste Street / Shattuck Avenue

Cycle (sec):	75	Critical Vol./Cap. (X):	1.125
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	19.4
Optimal Cycle:	180	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	22	22	0	0	22	22	0	0	0	27	27	27
Lanes:	1 0 2 0 0			0 0 1 1 0			0 0 0 0 0			0 1 0 1 0		
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	104	1277	0	0	1208	88	0	0	0	268	336	152
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	104	1277	0	0	1208	88	0	0	0	268	336	152
Added Vol:	0	37	0	0	213	45	0	0	0	32	73	0
Future:	30	160	0	0	130	20	0	0	0	40	80	40
Initial Fut:	134	1474	0	0	1551	153	0	0	0	340	489	192
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	134	1474	0	0	1551	153	0	0	0	340	489	192
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	134	1474	0	0	1551	153	0	0	0	340	489	192
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	134	1474	0	0	1551	153	0	0	0	340	489	192
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.10	0.95	1.00	1.00	0.94	0.94	1.00	1.00	1.00	0.90	0.90	0.90
Lanes:	1.00	2.00	0.00	0.00	1.82	0.18	0.00	0.00	0.00	0.66	0.96	0.38
Final Sat.:	190	3610	0	0	3243	320	0	0	0	1136	1634	641
Capacity Analysis Module:												
Vol/Sat:	0.71	0.41	0.00	0.00	0.48	0.48	0.00	0.00	0.00	0.30	0.30	0.30
Crit Moves:	****										****	
Green/Cycle:	0.53	0.53	0.00	0.00	0.53	0.53	0.00	0.00	0.00	0.36	0.36	0.36
Volume/Cap:	1.32	0.77	0.00	0.00	0.90	0.90	0.00	0.00	0.00	0.83	0.83	0.83
Delay/Veh:	202.5	6.3	0.0	0.0	10.9	10.9	0.0	0.0	0.0	28.6	28.6	28.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	202.5	6.3	0.0	0.0	10.9	10.9	0.0	0.0	0.0	28.6	28.6	28.6
DesignQueue:	3	32	0	0	34	3	0	0	0	10	14	6

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #54 Haste Street / Fulton Street

Cycle (sec):	80	Critical Vol./Cap. (X):	0.549
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	22.7
Optimal Cycle:	53	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	25	25	0	0	0	20	20	0
Lanes:	0 0 0 0 0			0 0 1 1 0			0 0 0 0 0			0 1 1 0 0		
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	0	0	0	580	154	0	0	0	50	604	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	580	154	0	0	0	50	604	0
Added Vol:	0	0	0	0	12	5	0	0	0	0	100	0
Future:	0	0	0	0	70	80	0	0	0	30	60	0
Initial Fut:	0	0	0	0	662	239	0	0	0	80	764	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	0	662	239	0	0	0	80	764	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	662	239	0	0	0	80	764	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	0	662	239	0	0	0	80	764	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	0.95	0.95	1.00
Lanes:	0.00	0.00	0.00	0.00	1.47	0.53	0.00	0.00	0.00	0.19	1.81	0.00
Final Sat.:	0	0	0	0	2546	919	0	0	0	342	3268	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.26	0.26	0.00	0.00	0.00	0.23	0.23	0.00
Crit Moves:					****						****	
Green/Cycle:	0.00	0.00	0.00	0.00	0.69	0.69	0.00	0.00	0.00	0.26	0.26	0.00
Volume/Cap:	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00	0.89	0.89	0.00
Delay/Veh:	0.0	0.0	0.0	0.0	5.7	5.7	0.0	0.0	0.0	40.8	40.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	5.7	5.7	0.0	0.0	0.0	40.8	40.8	0.0
DesignQueue:	0	0	0	0	10	4	0	0	0	3	27	0

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                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #55 Haste Street / Telegraph Avenue
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.483
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       14.4
Optimal Cycle:       40              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16     0     0    0     0     0    0     0     0   16    16
Lanes:        0  1  1  0  0   0  0  0  0  0   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     186  476     0     0    0     0     0    0     0     0  470    57
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  186  476     0     0    0     0     0    0     0     0  470    57
Added Vol:      0   12     0     0    0     0     0    0     0     0  100     0
Future:        50  100     0     0    0     0     0    0     0     0   50    30
Initial Fut:  236  588     0     0    0     0     0    0     0     0  620    87
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   236  588     0     0    0     0     0    0     0     0  620    87
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  236  588     0     0    0     0     0    0     0     0  620    87
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   236  588     0     0    0     0     0    0     0     0  620    87
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.93  0.93
Lanes:       0.57 1.43  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 1.75  0.25
Final Sat.:  1034 2576     0     0    0     0     0    0     0     0 3109   436
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.23 0.23  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.20  0.20
Crit Moves:       ****                                                ****
Green/Cycle: 0.40 0.40  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.49  0.49
Volume/Cap:  0.57 0.57  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.41  0.41
Delay/Veh:   16.2 16.2   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 12.3  12.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  16.2 16.2   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 12.3  12.3
DesignQueue:    6   15     0     0    0     0     0    0     0     0   13     2
********************************************************************************
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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #56 Haste Street / College Avenue
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.495
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       11.3
Optimal Cycle:       40              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16     0     0   16    16     0    0     0    16   16    16
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      88  236     0     0  337    56     0    0     0    90  244    29
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   88  236     0     0  337    56     0    0     0    90  244    29
Added Vol:      2   12     0     0   56     1     0    0     0     0    2     0
Future:        30   70     0     0   80    30     0    0     0    30   30    40
Initial Fut:  120  318     0     0  473    87     0    0     0   120  276    69
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   120  318     0     0  473    87     0    0     0   120  276    69
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  120  318     0     0  473    87     0    0     0   120  276    69
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   120  318     0     0  473    87     0    0     0   120  276    69
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.76 0.76  1.00  1.00 0.98  0.98  1.00 1.00  1.00  0.91 0.91  0.91
Lanes:       0.27 0.73  0.00  0.00 0.84  0.16  0.00 0.00  0.00  0.51 1.19  0.30
Final Sat.:   395 1046     0     0 1571   289     0    0     0   891 2049   512
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.30 0.30  0.00  0.00 0.30  0.30  0.00 0.00  0.00  0.13 0.13  0.13
Crit Moves:       ****                                                ****
Green/Cycle: 0.61 0.61  0.00  0.00 0.61  0.61  0.00 0.00  0.00  0.27 0.27  0.27
Volume/Cap:  0.50 0.50  0.00  0.00 0.49  0.49  0.00 0.00  0.00  0.50 0.50  0.50
Delay/Veh:    6.0  6.0   0.0   0.0  5.5   5.5   0.0  0.0   0.0  23.3 23.3  23.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   6.0  6.0   0.0   0.0  5.5   5.5   0.0  0.0   0.0  23.3 23.3  23.3
DesignQueue:    2    5     0     0    8     1     0    0     0     4    8     2
********************************************************************************
```

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-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #57 Dwight Way / Martin Luther King Way
*******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.993
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       28.5
Optimal Cycle:      137              Level Of Service:                  C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      71  821    60   113  860   272    49  444   111     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   71  821    60   113  860   272    49  444   111     0    0     0
Added Vol:     17   13     0     0   15    85     0   14     4     0    0     0
Future:        10  220    10    20   90    10    20   50    10     0    0     0
Initial Fut:   98 1054    70   133  965   367    69  508   125     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    98 1054    70   133  965   367    69  508   125     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   98 1054    70   133  965   367    69  508   125     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    98 1054    70   133  965   367    69  508   125     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.64 0.64  0.64  0.61 0.61  0.61  0.90 0.90  0.90  1.00 1.00  1.00
Lanes:       0.16 1.73  0.11  0.18 1.32  0.50  0.20 1.45  0.35  0.00 0.00  0.00
Final Sat.:   195 2095   139   212 1535   584   336 2473   609     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.50 0.50  0.50  0.63 0.63  0.63  0.21 0.21  0.21  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.63 0.63  0.63  0.63 0.63  0.63  0.21 0.21  0.21  0.00 0.00  0.00
Volume/Cap:  0.79 0.79  0.79  0.99 0.99  0.99  0.99 0.99  0.99  0.00 0.00  0.00
Delay/Veh:    9.3  9.3   9.3  28.5 28.5  28.5  61.9 61.9  61.9   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   9.3  9.3   9.3  28.5 28.5  28.5  61.9 61.9  61.9   0.0  0.0   0.0
DesignQueue:    2   18     1     2   16     6     2   18     4     0    0     0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #58 Dwight Way / Shattuck Avenue
*******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.927
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       16.8
Optimal Cycle:      103              Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  1  1  0    1  0  1  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0 1273   123   133 1390     0    77  426   200     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1273   123   133 1390     0    77  426   200     0    0     0
Added Vol:      0   33     0    14  230     0     5   10     0     0    0     0
Future:         0  160    30    10  140     0    10   50    10     0    0     0
Initial Fut:    0 1466   153   157 1760     0    92  486   210     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1466   153   157 1760     0    92  486   210     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1466   153   157 1760     0    92  486   210     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1466   153   157 1760     0    92  486   210     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  0.24 0.95  0.95  0.88 0.88  0.88  1.00 1.00  1.00
Lanes:       0.00 1.81  0.19  1.00 2.00  0.00  0.23 1.24  0.53  0.00 0.00  0.00
Final Sat.:     0 3223   336   463 3610     0   388 2052   887     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.45  0.45  0.34 0.49  0.00  0.24 0.24  0.24  0.00 0.00  0.00
Crit Moves:       ****        ****                   ****
Green/Cycle: 0.00 0.49  0.49  0.58 0.58  0.00  0.26 0.26  0.26  0.00 0.00  0.00
Volume/Cap:  0.00 0.93  0.93  0.58 0.83  0.00  0.93 0.93  0.93  0.00 0.00  0.00
Delay/Veh:    0.0 16.4  16.4  13.5  4.9   0.0  44.8 44.8  44.8   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 16.4  16.4  13.5  4.9   0.0  44.8 44.8  44.8   0.0  0.0   0.0
DesignQueue:    0   35     4     6   35     0     3   16     7     0    0     0
*******************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #59 Dwight Way / Fulton Street
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.619
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      17.3
Optimal Cycle:       45              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    21   21    0     0    0   16    16    0    0     0
Lanes:       0  0  0  0  1   2  0  0  0  0   0  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0    62  631    0     0    0  664    15    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0    62  631    0     0    0  664    15    0    0     0
Added Vol:     0    0     0   12    0     0    0   24     0    0    0     0
Future:        0    0    20  100    0     0    0   60    30    0    0     0
Initial Fut:   0    0    82  743    0     0    0  748    45    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0    82  743    0     0    0  748    45    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0    82  743    0     0    0  748    45    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0    82  743    0     0    0  748    45    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  0.87 0.59 1.00  1.00 1.00 0.94  0.94 1.00 1.00  1.00
Lanes:       0.00 0.00  1.00 2.00 0.00  0.00 0.00 1.89  0.11 0.00 0.00  0.00
Final Sat.:    0    0  1644 2245    0     0    0 3374   203    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.05 0.33 0.00  0.00 0.00 0.22  0.22 0.00 0.00  0.00
Crit Moves:                  ****                ****
Green/Cycle: 0.00 0.00  0.54 0.54 0.00  0.00 0.00 0.36  0.36 0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.09 0.62 0.00  0.00 0.00 0.62  0.62 0.00 0.00  0.00
Delay/Veh:    0.0  0.0   8.7 14.5  0.0   0.0  0.0 20.8  20.8  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   8.7 14.5  0.0   0.0  0.0 20.8  20.8  0.0  0.0   0.0
DesignQueue:   0    0     2   15    0     0    0   21     1    0    0     0
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #60 Dwight Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.981
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      34.3
Optimal Cycle:      131              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   15    15    0    0     0   17   17    17    0    0     0
Lanes:       0  0  1  1  0   0  0  0  0  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  590   149    0    0     0  130  671   813    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  590   149    0    0     0  130  671   813    0    0     0
Added Vol:     0    4     0    0    0     0    9   27    27    0    0     0
Future:        0  132    11    0    0     0   11   66   110    0    0     0
Initial Fut:   0  726   160    0    0     0  150  764   950    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  726   160    0    0     0  150  764   950    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  726   160    0    0     0  150  764   950    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  726   160    0    0     0  150  764   950    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.92  0.92 1.00 1.00  1.00 0.81 0.81  0.81 1.00 1.00  1.00
Lanes:       0.00 1.64  0.36 0.00 0.00  0.00 0.16 0.84  1.00 0.00 0.00  0.00
Final Sat.:    0 2878   634    0    0     0  253 1288  1541    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.25 0.00 0.00  0.00 0.59 0.59  0.62 0.00 0.00  0.00
Crit Moves:       ****                                  ****
Green/Cycle: 0.00 0.26  0.26 0.00 0.00  0.00 0.63 0.63  0.63 0.00 0.00  0.00
Volume/Cap:  0.00 0.98  0.98 0.00 0.00  0.00 0.94 0.94  0.98 0.00 0.00  0.00
Delay/Veh:    0.0 51.9  51.9  0.0  0.0   0.0 22.6 22.6  29.2  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 51.9  51.9  0.0  0.0   0.0 22.6 22.6  29.2  0.0  0.0   0.0
DesignQueue:   0   22     5    0    0     0    2   13    16    0    0     0
********************************************************************************
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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #61 Dwight Way / College Avenue
*******************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.618
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       14.5
Optimal Cycle:       39               Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   16    16   16   16     0   15   15    15    0    0     0
Lanes:       0  0  0  1  0    0  1  0  0  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  294    52   49  374     0   34  483   129    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  294    52   49  374     0   34  483   129    0    0     0
Added Vol:     0   13     0    0   56     0    1   22     4    0    0     0
Future:        0   50    60   20   80     0   30    0    10    0    0     0
Initial Fut:   0  357   112   69  510     0   65  505   143    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  357   112   69  510     0   65  505   143    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  357   112   69  510     0   65  505   143    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  357   112   69  510     0   65  505   143    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.97  0.97 0.90 0.90  1.00 0.89 0.89  0.89 1.00 1.00  1.00
Lanes:       0.00 0.76  0.24 0.12 0.88  0.00 0.18 1.42  0.40 0.00 0.00  0.00
Final Sat.:    0 1400   439  205 1513     0  310 2406   681    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.26  0.26 0.34 0.34  0.00 0.21 0.21  0.21 0.00 0.00  0.00
Crit Moves:                       ****             ****
Green/Cycle: 0.00 0.55  0.55 0.55 0.55  0.00 0.34 0.34  0.34 0.00 0.00  0.00
Volume/Cap:  0.00 0.47  0.47 0.62 0.62  0.00 0.62 0.62  0.62 0.00 0.00  0.00
Delay/Veh:    0.0  8.2   8.2 10.6 10.6   0.0 21.8 21.8  21.8  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  8.2   8.2 10.6 10.6   0.0 21.8 21.8  21.8  0.0  0.0   0.0
DesignQueue:   0    7     2    1   10     0    2   14     4    0    0     0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #62 Dwight Way / Piedmont Avenue / Warring Street
*******************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.470
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       13.6
Optimal Cycle:       61               Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   29    29   29   29     0   24   24    24   24    0    24
Lanes:       0  0  1  1  0    0  1  1  0  0    1  0  1  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  527     1    8  353     0  132  162   307   53    0   112
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  527     1    8  353     0  132  162   307   53    0   112
Added Vol:     0   27     0    0  153     0    0    0    22    0    0     0
Future:        0   88    22   11   33     0   22   11    44   33    0    11
Initial Fut:   0  642    23   19  539     0  154  173   373   86    0   123
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  642    23   19  539     0  154  173   373   86    0   123
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  642    23   19  539     0  154  173   373   86    0   123
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  642    23   19  539     0  154  173   373   86    0   123
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.95  0.95 0.88 0.88  1.00 0.66 1.00  0.85 0.76 1.00  0.76
Lanes:       0.00 1.93  0.07 0.07 1.93  0.00 1.00 1.00  1.00 0.41 0.00  0.59
Final Sat.:    0 3468   124  114 3236     0 1250 1900  1615  594    0   850
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.19  0.19 0.17 0.17  0.00 0.12 0.09  0.23 0.14 0.00  0.14
Crit Moves:       ****                                  ****
Green/Cycle: 0.00 0.41  0.41 0.41 0.41  0.00 0.47 0.47  0.47 0.47 0.00  0.47
Volume/Cap:  0.00 0.45  0.45 0.40 0.40  0.00 0.26 0.19  0.49 0.31 0.00  0.31
Delay/Veh:    0.0 14.9  14.9 14.6 14.6   0.0 11.4 10.9  13.2 11.7  0.0  11.7
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 14.9  14.9 14.6 14.6   0.0 11.4 10.9  13.2 11.7  0.0  11.7
DesignQueue:   0   15     1    0   13     0    3    4     8    2    0     3
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #63 Dwight Avenue / Prospect Street
********************************************************************************
Average Delay (sec/veh):      6.0          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0    27    0   165   187  128     0     0   93    16
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    27    0   165   187  128     0     0   93    16
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0    0     0    10    0    20    20   20     0     0   20     0
Initial Fut:    0    0     0    37    0   185   207  148     0     0  113    16
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    37    0   185   207  148     0     0  113    16
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0    37    0   185   207  148     0     0  113    16
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   683 xxxx   121   129 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   418 xxxx   936  1469 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   367 xxxx   936  1469 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  744 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.9 xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            11.9            xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #64 Adeline Street / Ward Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         90               Critical Vol./Cap. (X):        1.000
Loss Time (sec):      8 (Y+R =  6 sec) Average Delay (sec/veh):       32.9
Optimal Cycle:      180               Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   25    25     0   25    25    19    0    19     0    0     0
Lanes:        0  0  0  1  0    0  0  2  0  1    2  0  0  0  1    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  690     5     0  957   825   903    0     2     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  690     5     0  957   825   903    0     2     0    0     0
Added Vol:      0   25     0     0  187    56     8    0     0     0    0     0
Future:         0   50     0     0   50   110   130    0     0     0    0     0
Initial Fut:    0  765     5     0 1194   991  1041    0     2     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  765     5     0 1194   991  1041    0     2     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  765     5     0 1194   991  1041    0     2     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  765     5     0 1194   991  1041    0     2     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  1.00 0.95  0.85  0.92 1.00  0.85  1.00 1.00  1.00
Lanes:       0.00 0.99  0.01  0.00 2.00  1.00  2.00 0.00  1.00  0.00 0.00  1.00
Final Sat.:     0 1886    12     0 3610  1615  3502    0  1615     0    0  1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.41  0.41  0.00 0.33  0.61  0.30 0.00  0.00  0.00 0.00  0.00
Crit Moves:                               ****  ****
Green/Cycle: 0.00 0.61  0.61  0.00 0.61  0.61  0.30 0.00  0.30  0.00 0.00  0.00
Volume/Cap:  0.00 0.66  0.66  0.00 0.54  1.00  1.00 0.00  0.00  0.00 0.00  0.00
Delay/Veh:    0.0 14.2  14.2   0.0 11.0  45.9  59.4  0.0  22.3   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 14.2  14.2   0.0 11.0  45.9  59.4  0.0  22.3   0.0  0.0   0.0
DesignQueue:    0   17     0     0   25    22    39    0     0     0    0     0
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #65 Derby Street / Warring Street

Cycle (sec):	100	Critical Vol./Cap. (X):	1.818
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	309.5
Optimal Cycle:	0	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 0 0 0			0 0 1! 0 0			0 1 0 0 0			0 0 0 1 0		
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	0	0	765	0	30	7	62	0	0	75	780
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	765	0	30	7	62	0	0	75	780
Added Vol:	0	0	0	174	0	0	0	0	0	0	0	27
PasserByVol:	0	0	0	110	0	10	0	0	0	0	0	120
Initial Fut:	0	0	0	1049	0	40	7	62	0	0	75	927
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	1049	0	40	7	62	0	0	75	927
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	1049	0	40	7	62	0	0	75	927
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	0	0	1049	0	40	7	62	0	0	75	927
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.96	0.00	0.04	0.10	0.90	0.00	0.00	0.07	0.93
Final Sat.:	0	0	0	577	0	22	53	471	0	0	50	624
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	1.82	xxxx	1.82	0.13	0.13	xxxx	xxxx	1.49	1.49
Crit Moves:				****				****			****	
Delay/Veh:	0.0	0.0	0.0	390.2	0.0	390.2	10.9	10.9	0.0	0.0	242	242.5
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	390.2	0.0	390.2	10.9	10.9	0.0	0.0	242	242.5
LOS by Move:	*	*	*	F	*	F	B	B	*	*	F	F
ApproachDel:		xxxxxx			390.2			10.9			242.5	
Delay Adj:		xxxxx			1.00			1.00			1.00	
ApprAdjDel:		xxxxxx			390.2			10.9			242.5	
LOS by Appr:		*			F			B			F	

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #66 Derby Street / Claremont Blvd.

Cycle (sec):	65	Critical Vol./Cap. (X):	0.866
Loss Time (sec):	8 (Y+R = 5 sec)	Average Delay (sec/veh):	34.7
Optimal Cycle:	72	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	18	0	18	0	0	0	0	35	35	35	35	0
Lanes:	0 0 1! 0 0			0 0 0 0 0			0 0 0 1 0			0 1 0 0 0		
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	4	0	225	0	0	0	0	872	11	31	741	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	0	225	0	0	0	0	872	11	31	741	0
Added Vol:	0	0	0	0	0	0	0	174	0	0	27	0
PasserByVol:	0	0	0	0	0	0	0	120	0	0	120	0
Initial Fut:	4	0	225	0	0	0	0	1166	11	31	888	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	4	0	225	0	0	0	0	1166	11	31	888	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	0	225	0	0	0	0	1166	11	31	888	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	4	0	225	0	0	0	0	1166	11	31	888	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.86	1.00	0.86	1.00	1.00	1.00	1.00	1.00	1.00	0.94	0.94	1.00
Lanes:	0.02	0.00	0.98	0.00	0.00	0.00	0.00	0.99	0.01	0.03	0.97	0.00
Final Sat.:	29	0	1614	0	0	0	0	1880	18	60	1728	0
Capacity Analysis Module:												
Vol/Sat:	0.14	0.00	0.14	0.00	0.00	0.00	0.00	0.62	0.62	0.51	0.51	0.00
Crit Moves:	****							****				
Green/Cycle:	0.28	0.00	0.28	0.00	0.00	0.00	0.00	0.60	0.60	0.60	0.60	0.00
Volume/Cap:	0.50	0.00	0.50	0.00	0.00	0.00	0.00	1.03	1.03	0.86	0.86	0.00
Delay/Veh:	23.7	0.0	23.7	0.0	0.0	0.0	0.0	48.7	48.7	19.5	19.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	23.7	0.0	23.7	0.0	0.0	0.0	0.0	48.7	48.7	19.5	19.5	0.0
DesignQueue:	0	0	6	0	0	0	0	20	0	1	15	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #67 Ashby Avenue / Seventh Street

Cycle (sec):	110	Critical Vol./Cap. (X):	1.130
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	94.7
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0	1 0	0 1	0	1 0	1 0	1	1 0	1 0	1	1 0
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM												
Base Vol:	134	404	68	107	270	476	263	546	113	98	774	31
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	134	404	68	107	270	476	263	546	113	98	774	31
Added Vol:	0	0	0	0	0	0	0	14	0	0	92	0
Future:	60	60	10	90	30	0	30	60	60	20	60	70
Initial Fut:	194	464	78	197	300	476	293	620	173	118	926	101
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	194	464	78	197	300	476	293	620	173	118	926	101
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	194	464	78	197	300	476	293	620	173	118	926	101
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	194	464	78	197	300	476	293	620	173	118	926	101
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.48	0.48	0.48	0.52	0.52	0.52	0.95	0.92	0.92	0.95	0.94	0.94
Lanes:	0.53	1.26	0.21	0.40	0.62	0.98	1.00	1.56	0.44	1.00	1.80	0.20
Final Sat.:	481	1151	194	401	611	969	1805	2729	762	1805	3206	350
Capacity Analysis Module:												
Vol/Sat:	0.40	0.40	0.40	0.49	0.49	0.49	0.16	0.23	0.23	0.07	0.29	0.29
Crit Moves:					****			****			****	
Green/Cycle:	0.43	0.43	0.43	0.43	0.43	0.43	0.20	0.20	0.20	0.26	0.26	0.26
Volume/Cap:	0.93	0.93	0.93	1.13	1.13	1.13	0.81	1.13	1.13	0.26	1.13	1.13
Delay/Veh:	48.0	48.0	48.0	104.3	104	104.3	61.5	122	122.2	34.6	114	114.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	48.0	48.0	48.0	104.3	104	104.3	61.5	122	122.2	34.6	114	114.3
DesignQueue:	7	17	3	7	11	18	15	32	9	5	45	5

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #68 Ashby Avenue / San Pablo Avenue

Cycle (sec):	110	Critical Vol./Cap. (X):	0.892
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	41.2
Optimal Cycle:	99	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	4	17	17	4	19	19	18	18	18	18	18	18
Lanes:	1 0	1	1 0	1 0	1	1 0	1 0	1	1 0	0 1	0	1 0
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM												
Base Vol:	162	999	79	185	873	113	86	592	170	20	612	143
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	162	999	79	185	873	113	86	592	170	20	612	143
Added Vol:	13	26	28	0	14	16	0	11	3	58	62	0
Future:	20	190	90	20	320	30	20	90	50	40	90	30
Initial Fut:	195	1215	197	205	1207	159	106	693	223	118	764	173
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	195	1215	197	205	1207	159	106	693	223	118	764	173
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	195	1215	197	205	1207	159	106	693	223	118	764	173
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	195	1215	197	205	1207	159	106	693	223	118	764	173
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.93	0.93	1.00	0.92	0.92	0.88	0.88	0.88
Lanes:	1.00	1.72	0.28	1.00	1.77	0.23	1.00	1.51	0.49	0.22	1.45	0.33
Final Sat.:	1805	3041	493	1805	3136	413	1900	2633	847	376	2434	551
Capacity Analysis Module:												
Vol/Sat:	0.11	0.40	0.40	0.11	0.38	0.38	0.06	0.26	0.26	0.31	0.31	0.31
Crit Moves:		****		****							****	
Green/Cycle:	0.13	0.50	0.50	0.11	0.48	0.48	0.31	0.31	0.31	0.31	0.31	0.31
Volume/Cap:	0.80	0.80	0.80	1.00	0.80	0.80	0.18	0.84	0.84	1.00	1.00	1.00
Delay/Veh:	63.6	25.6	25.6	111.7	27.1	27.1	26.9	40.2	40.2	64.6	64.6	64.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	63.6	25.6	25.6	111.7	27.1	27.1	26.9	40.2	40.2	64.6	64.6	64.6
DesignQueue:	11	41	7	11	42	6	5	31	10	5	35	8

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                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #69 Ashby Avenue / Adeline Street
********************************************************************************
Cycle (sec):        140               Critical Vol./Cap. (X):        0.627
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        39.5
Optimal Cycle:       86               Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    4   32    32    6   38    38    4   22    22    4   32    32
Lanes:       1  0  1  1  0   1  0  2  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     92  693    85    31  700   169   135  491    39    68  547    39
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  92  693    85    31  700   169   135  491    39    68  547    39
Added Vol:     1    2     0     0   13    42     6   22     4     0   57     0
Future:       60   70    10    10   10    80    50  160    20    10   50    10
Initial Fut: 153  765    95    41  723   291   191  673    63    78  654    49
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:  153  765    95    41  723   291   191  673    63    78  654    49
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 153  765    95    41  723   291   191  673    63    78  654    49
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:  153  765    95    41  723   291   191  673    63    78  654    49
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.87  0.87  0.95 0.94  0.94  0.95 0.94  0.94
Lanes:       1.00 1.78  0.22  1.00 2.14  0.86  1.00 1.83  0.17  1.00 1.86  0.14
Final Sat.:  1805 3160   392  1805 3539  1425  1805 3258   305  1805 3325   249
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.24  0.24  0.02 0.20  0.20  0.11 0.21  0.21  0.04 0.20  0.20
Crit Moves:  ****                  ****        ****                   ****
Green/Cycle: 0.14 0.42  0.42  0.04 0.33  0.33  0.17 0.40  0.40  0.08 0.31  0.31
Volume/Cap:  0.63 0.58  0.58  0.53 0.63  0.63  0.63 0.52  0.52  0.52 0.63  0.63
Delay/Veh:   62.3 31.9  31.9  72.4 40.8  40.8  62.1 28.9  28.9  71.7 41.2  41.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  62.3 31.9  31.9  72.4 40.8  40.8  62.1 28.9  28.9  71.7 41.2  41.2
DesignQueue:   11   37     5     3   40    16    13   33     3     6   37     3
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                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #70 Ashby Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         80               Critical Vol./Cap. (X):        0.732
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):        42.8
Optimal Cycle:       60               Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   21   21    21    6   21    21   20   20    20   20   20    20
Lanes:       0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     52  556    30   200  585    56    33  536    40    32  541   176
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  52  556    30   200  585    56    33  536    40    32  541   176
Added Vol:     0   14     0    28  101    56     7   14     0     0    1     3
Future:       10   10    10    20   20    10    10  170    20    10   60    20
Initial Fut:  62  580    40   248  706   122    50  720    60    42  602   199
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   62  580    40   248  706   122    50  720    60    42  602   199
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  62  580    40   248  706   122    50  720    60    42  602   199
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   62  580    40   248  706   122    50  720    60    42  602   199
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.49 0.49  0.49  0.89 0.89  0.89  0.90 0.90  0.90  0.88 0.88  0.88
Lanes:       0.18 1.70  0.12  0.46 1.31  0.23  0.12 1.74  0.14  0.10 1.43  0.47
Final Sat.:   168 1573   108   781 2224   384   205 2958   246   166 2376   785
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.37 0.37  0.37  0.32 0.32  0.32  0.24 0.24  0.24  0.25 0.25  0.25
Crit Moves:       ****                                                ****
Green/Cycle: 0.33 0.33  0.33  0.32 0.32  0.32  0.52 0.52  0.52  0.52 0.52  0.52
Volume/Cap:  1.13 1.13  1.13  0.98 0.98  0.98  0.46 0.46  0.46  0.48 0.48  0.48
Delay/Veh:  106.7  107 106.7  48.8 48.8  48.8  12.8 12.8  12.8  13.0 13.0  13.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 106.7  107 106.7  48.8 48.8  48.8  12.8 12.8  12.8  13.0 13.0  13.0
DesignQueue:    2   18     1     8   23     4     1   16     1     1   13     4
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365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #71 Ashby Avenue / Telegraph Avenue

Cycle (sec):	80		Critical Vol./Cap. (X):	1.008
Loss Time (sec):	12	(Y+R = 6 sec)	Average Delay (sec/veh):	27.0
Optimal Cycle:	107		Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Prot+Permit			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	21	21	21	6	21	21	25	25	25	25	25	25
Lanes:	1 0	1 1	0	1 0	1 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	210	675	75	176	902	63	68	531	184	148	642	99
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	210	675	75	176	902	63	68	531	184	148	642	99
Added Vol:	1	4	0	2	25	0	0	39	3	0	3	0
Future:	30	80	10	10	60	10	30	110	50	20	50	20
Initial Fut:	241	759	85	188	987	73	98	680	237	168	695	119
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	241	759	85	188	987	73	98	680	237	168	695	119
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	241	759	85	188	987	73	98	680	237	168	695	119
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	241	759	85	188	987	73	98	680	237	168	695	119
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.56	0.94	0.94	0.95	0.91	0.91	0.95	0.93	0.93
Lanes:	1.00	1.80	0.20	1.00	1.86	0.14	1.00	1.48	0.52	1.00	1.71	0.29
Final Sat.:	1805	3198	358	1070	3328	246	1805	2573	897	1805	3014	516
Capacity Analysis Module:												
Vol/Sat:	0.13	0.24	0.24	0.18	0.30	0.30	0.05	0.26	0.26	0.09	0.23	0.23
Crit Moves:	****				****			****		****		
Green/Cycle:	0.35	0.35	0.35	0.94	0.46	0.46	0.35	0.35	0.35	0.35	0.35	0.35
Volume/Cap:	0.38	0.68	0.68	0.19	0.65	0.65	0.16	0.76	0.76	0.27	0.66	0.66
Delay/Veh:	25.7	30.2	30.2	3.0	20.1	20.1	23.8	34.3	34.3	25.3	31.3	31.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.7	30.2	30.2	3.0	20.1	20.1	23.8	34.3	34.3	25.3	31.3	31.3
DesignQueue:	9	30	3	6	33	2	4	27	10	6	28	5

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #72 Ashby Avenue / College Avenue

Cycle (sec):	80		Critical Vol./Cap. (X):	0.969
Loss Time (sec):	8	(Y+R = 4 sec)	Average Delay (sec/veh):	39.5
Optimal Cycle:	134		Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	18	18	18	18	18	18	30	30	30	30	30	30
Lanes:	0 0	1! 0	0	0 0	1! 0	0	0 0	1! 0	0	0 0	1! 0	0
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	75	293	68	159	279	58	15	683	87	10	466	151
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	75	293	68	159	279	58	15	683	87	10	466	151
Added Vol:	0	3	0	41	21	-2	2	39	0	0	5	8
Future:	10	60	10	20	60	10	10	120	20	10	60	30
Initial Fut:	85	356	78	220	360	66	27	842	107	20	531	189
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	85	356	78	220	360	66	27	842	107	20	531	189
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	85	356	78	220	360	66	27	842	107	20	531	189
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	85	356	78	220	360	66	27	842	107	20	531	189
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.78	0.78	0.78	0.99	0.99	0.99	0.99	0.99	0.99	0.97	0.97	0.97
Lanes:	0.16	0.69	0.15	0.34	0.56	0.10	0.03	0.86	0.11	0.03	0.72	0.25
Final Sat.:	242	1015	222	638	1044	191	52	1615	205	50	1317	469
Capacity Analysis Module:												
Vol/Sat:	0.35	0.35	0.35	0.34	0.34	0.34	0.52	0.52	0.52	0.40	0.40	0.40
Crit Moves:		****						****				
Green/Cycle:	0.38	0.38	0.38	0.38	0.38	0.38	0.53	0.53	0.53	0.53	0.53	0.53
Volume/Cap:	0.93	0.93	0.93	0.92	0.92	0.92	0.99	0.99	0.99	0.77	0.77	0.77
Delay/Veh:	49.2	49.2	49.2	43.0	43.0	43.0	46.0	46.0	46.0	21.0	21.0	21.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	49.2	49.2	49.2	43.0	43.0	43.0	46.0	46.0	46.0	21.0	21.0	21.0
DesignQueue:	3	11	2	7	11	2	1	21	3	0	12	4

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #73 Ashby Avenue / Claremont Avenue

Cycle (sec):	70	Critical Vol./Cap. (X):	0.779
Loss Time (sec):	12 (Y+R = 12 sec)	Average Delay (sec/veh):	26.6
Optimal Cycle:	72	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	16	16	16	16	16	16	28	28	28	28	28	28
Lanes:	0 1	0 1	0	1 1	0 1	0	0 1	0 1	0	0 1	0 1	0
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	45	373	189	432	285	49	47	592	5	66	504	232
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	45	373	189	432	285	49	47	592	5	66	504	232
Added Vol:	0	0	0	174	0	0	0	79	0	0	13	27
Future:	10	60	20	60	50	20	40	130	10	10	60	20
Initial Fut:	55	433	209	666	335	69	87	801	15	76	577	279
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	55	433	209	666	335	69	87	801	15	76	577	279
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	55	433	209	666	335	69	87	801	15	76	577	279
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	55	433	209	666	335	69	87	801	15	76	577	279
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Lanes:	0.16	1.24	0.60	1.87	0.94	0.19	0.19	1.78	0.03	0.16	1.24	0.60
Final Sat.:	285	2243	1082	3370	1695	349	348	3202	60	294	2235	1081
Capacity Analysis Module:												
Vol/Sat:	0.19	0.19	0.19	0.20	0.20	0.20	0.25	0.25	0.25	0.26	0.26	0.26
Crit Moves:	****			****							****	
Green/Cycle:	0.22	0.22	0.22	0.22	0.22	0.22	0.39	0.39	0.39	0.39	0.39	0.39
Volume/Cap:	0.87	0.87	0.87	0.89	0.89	0.89	0.64	0.64	0.64	0.66	0.66	0.66
Delay/Veh:	37.0	37.0	37.0	35.6	35.6	35.6	17.3	17.3	17.3	17.6	17.6	17.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.0	37.0	37.0	35.6	35.6	35.6	17.3	17.3	17.3	17.6	17.6	17.6
DesignQueue:	2	14	7	22	11	2	2	21	0	2	15	7

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #74 Tunnel Road / SR 13

Cycle (sec):	65	Critical Vol./Cap. (X):	0.899
Loss Time (sec):	8 (Y+R = 4 sec)	Average Delay (sec/veh):	16.6
Optimal Cycle:	81	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	2 0	1	2 0	1 0	0	0 0	0 0	0	1 0	0 0	2
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	1130	256	534	1095	0	0	0	0	128	0	155
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1130	256	534	1095	0	0	0	0	128	0	155
Added Vol:	0	40	0	126	128	0	0	0	0	0	0	0
Future:	0	80	0	70	140	0	0	0	0	0	0	10
Initial Fut:	0	1250	256	730	1363	0	0	0	0	128	0	165
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	1250	256	730	1363	0	0	0	0	128	0	165
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1250	256	730	1363	0	0	0	0	128	0	165
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	1250	256	730	1363	0	0	0	0	128	0	165
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.85	0.92	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.75
Lanes:	0.00	2.00	1.00	2.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00
Final Sat.:	0	3610	1615	3502	1900	0	0	0	0	1805	0	2842
Capacity Analysis Module:												
Vol/Sat:	0.00	0.35	0.16	0.21	0.72	0.00	0.00	0.00	0.00	0.07	0.00	0.06
Crit Moves:	****				****					****		
Green/Cycle:	0.00	0.50	0.50	0.30	0.80	0.00	0.00	0.00	0.00	0.08	0.00	0.38
Volume/Cap:	0.00	0.70	0.32	0.70	0.90	0.00	0.00	0.00	0.00	0.90	0.00	0.15
Delay/Veh:	0.0	13.7	10.0	22.2	12.3	0.0	0.0	0.0	0.0	76.2	0.0	13.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	13.7	10.0	22.2	12.3	0.0	0.0	0.0	0.0	76.2	0.0	13.4
DesignQueue:	0	25	5	19	12	0	0	0	0	4	0	4

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------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #167 Piedmont Avenue / Channing Way
********************************************************************************
Average Delay (sec/veh): OVERFLOW          Worst Case Level Of Service:       F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      85  311    45    43  406    85    42   59    87    36  109    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   85  311    45    43  406    85    42   59    87    36  109    15
Added Vol:      4   21     0     0  112     6    36    0    41     0    0     0
Future:        14   53     8     7   69    14     7   10    15     6   19     3
Initial Fut:  103  385    53    50  587   105    85   69   143    42  128    18
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   103  385    53    50  587   105    85   69   143    42  128    18
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   103  385    53    50  587   105    85   69   143    42  128    18
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  692 xxxx xxxxx   438 xxxx xxxxx  1430 1384   640  1463 1410   412
Potent Cap.:  912 xxxx xxxxx  1133 xxxx xxxxx   113  145   479   108  140   645
Move Cap.:    912 xxxx xxxxx  1133 xxxx xxxxx     0  122   479    37  117   645
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.4 xxxx xxxxx   8.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx   84 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  680 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            680.1
ApproachLOS:        *                *                F                F
```



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------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                               PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1121 Highland Place / Heart Avenue / Cyclotron Road
********************************************************************************
Average Delay (sec/veh):      0.8          Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        1  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       2    0     0     5    2    13    11   56     0     0  342    43
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    2    0     0     5    2    13    11   56     0     0  342    43
Added Vol:      0    0     0     0    0     0     0   17     0     0   77     0
Future:         1    0     0     2    1     6     5   26     0     0  161    20
Initial Fut:    3    0     0     7    3    19    16   99     0     0  580    63
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     3    0     0     7    3    19    16   99     0     0  580    63
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     3    0     0     7    3    19    16   99     0     0  580    63
Critical Gap Module:
Critical Gp:  7.1 xxxx xxxxx   7.1  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5 xxxx xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  754 xxxx xxxxx   743  743   612   643 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  328 xxxx xxxxx   334  346   497   951 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    310 xxxx xxxxx   330  340   497   951 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 16.7 xxxx xxxxx xxxxx xxxx xxxxx   8.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    C    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  425 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 14.1 xxxxx   8.8 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:      16.7             14.1           xxxxxx           xxxxxx
ApproachLOS:        C                B                *                *
```

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
  Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project
                                  PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1122 Stadium Rim Road / Canyon Road
********************************************************************************
Average Delay (sec/veh):      0.2           Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    0  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  265     3     0  251     0     0    0     0     6    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  265     3     0  251     0     0    0     0     6    0     1
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0   44     1     0   43     0     0    0     0     1    0     0
Initial Fut:    0  309     4     0  294     0     0    0     0     7    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  309     4     0  294     0     0    0     0     7    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  309     4     0  294     0     0    0     0     7    0     1
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   605 xxxx   311
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   464 xxxx   734
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   464 xxxx   734
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  486 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.5 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    B     *
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            12.5
ApproachLOS:         *                *                *               B
```

Variant—A.M. Peak Hour

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-------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #1 Marin Avenue / San Pablo Avenue
*******************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        1.022
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):        94.1
Optimal Cycle:      180               Level Of Service:                 F
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     102  363    59   106  891    15    38  672   235   147  768    90
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  102  363    59   106  891    15    38  672   235   147  768    90
Added Vol:      1   15     1     7  153     0     0   20     8     4    2     2
Future:       120  120    64    20  131    14    14   67    30    34  267    10
Initial Fut:  223  498   124   133 1175    29    52  759   273   185 1037   102
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   223  498   124   133 1175    29    52  759   273   185 1037   102
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  223  498   124   133 1175    29    52  759   273   185 1037   102
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   223  498   124   133 1175    29    52  759   273   185 1037   102
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.92  0.92  0.95 0.95  0.95  0.95 0.91  0.91  0.95 0.94  0.94
Lanes:       1.00 1.60  0.40  1.00 1.95  0.05  1.00 1.47  0.53  1.00 1.82  0.18
Final Sat.:  1805 2804   698  1805 3509    87  1805 2549   917  1805 3244   319
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.18  0.18  0.07 0.33  0.33  0.03 0.30  0.30  0.10 0.32  0.32
Crit Moves:  ****                  ****                  ****  ****
Green/Cycle: 0.12 0.36  0.36  0.12 0.36  0.36  0.17 0.21  0.21  0.15 0.31  0.31
Volume/Cap:  1.03 0.49  0.49  0.61 0.93  0.93  0.17 1.42  1.42  0.68 1.03  1.03
Delay/Veh:  113.1 25.2  25.2  47.0 42.7  42.7  35.7  236 235.7  47.3 69.9  69.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 113.1 25.2  25.2  47.0 42.7  42.7  35.7  236 235.7  47.3 69.9  69.9
DesignQueue:   11   19     5     7   46     1     2   36    13     9   43     4
*******************************************************************************
```



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-------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #2 Marin Avenue / The Alameda
*******************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.666
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        15.4
Optimal Cycle:       56               Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    25   25    25    25   25    25    23   23    23    23   23    23
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     173  189     7    38  279    23    33  494   291    20  420    48
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  173  189     7    38  279    23    33  494   291    20  420    48
Added Vol:      3    1     1     0    7     0     0   18     9     5    5     0
Future:       110    0    10    10  190    20     0   70    50    10  170    10
Initial Fut:  286  190    18    48  476    43    33  582   350    35  595    58
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   286  190    18    48  476    43    33  582   350    35  595    58
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  286  190    18    48  476    43    33  582   350    35  595    58
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   286  190    18    48  476    43    33  582   350    35  595    58
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.55 0.55  0.55  0.83 0.83  0.83  0.82 0.82  0.82  0.83 0.83  0.83
Lanes:       1.00 0.91  0.09  0.17 1.68  0.15  0.07 1.21  0.72  0.10 1.73  0.17
Final Sat.:  1036  947    90   266 2641   239   107 1889  1136   160 2712   264
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.28 0.20  0.20  0.18 0.18  0.18  0.31 0.31  0.31  0.22 0.22  0.22
Crit Moves:  ****                               ****
Green/Cycle: 0.41 0.41  0.41  0.41 0.41  0.41  0.46 0.46  0.46  0.46 0.46  0.46
Volume/Cap:  0.67 0.48  0.48  0.44 0.44  0.44  0.67 0.67  0.67  0.47 0.47  0.47
Delay/Veh:   20.1 15.6  15.6  14.7 14.7  14.7  16.0 16.0  16.0  13.1 13.1  13.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  20.1 15.6  15.6  14.7 14.7  14.7  16.0 16.0  16.0  13.1 13.1  13.1
DesignQueue:    6    4     0     1   10     1     1   12     7     1   12     1
*******************************************************************************
```

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------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                               AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #3 Gilman Street / Sixth Street
******************************************************************************
Cycle (sec):        65              Critical Vol./Cap. (X):        0.688
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):        16.5
Optimal Cycle:      46              Level Of Service:                  B
******************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   19   19    19   19   19    19   19   19    19   19   19    19
Lanes:       0  0  1! 0  0   0  1  0  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     122   24    56   11   45    28   21  416   114   47  430    20
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  122   24    56   11   45    28   21  416   114   47  430    20
Added Vol:      1    0     0    0    0     0    0    1    10    0    0     0
Future:        70    0    28    0   30     0    0   37    10   48   67     0
Initial Fut:  193   24    84   11   75    28   21  454   134   95  497    20
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   193   24    84   11   75    28   21  454   134   95  497    20
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  193   24    84   11   75    28   21  454   134   95  497    20
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   193   24    84   11   75    28   21  454   134   95  497    20
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.70 0.70  0.70 0.84 0.84  0.84 0.95 0.95  0.95 0.85 0.85  0.85
Lanes:       0.64 0.08  0.28 0.19 1.32  0.49 0.03 0.75  0.22 0.16 0.81  0.03
Final Sat.:   858  107   373  310 2111   788   62 1341   396  251 1314    53
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.22  0.22 0.04 0.04  0.04 0.34 0.34  0.34 0.38 0.38  0.38
Crit Moves:       ****                                           ****
Green/Cycle: 0.33 0.33  0.33 0.33 0.33  0.33 0.55 0.55  0.55 0.55 0.55  0.55
Volume/Cap:  0.69 0.69  0.69 0.11 0.11  0.11 0.62 0.62  0.62 0.69 0.69  0.69
Delay/Veh:   27.5 27.5  27.5 15.5 15.5  15.5 12.8 12.8  12.8 14.9 14.9  14.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  27.5 27.5  27.5 15.5 15.5  15.5 12.8 12.8  12.8 14.9 14.9  14.9
DesignQueue:    5    1     2    0    2     1    0    8     2    2    9     0
******************************************************************************
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------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                               AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #4 Gilman Street / San Pablo Avenue
******************************************************************************
Cycle (sec):       100              Critical Vol./Cap. (X):        0.897
Loss Time (sec):    12 (Y+R =  5 sec) Average Delay (sec/veh):        47.2
Optimal Cycle:     108              Level Of Service:                  D
******************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    4   35    35    4   35    35   31   31    31   31   31    31
Lanes:       1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     113  401    25   74 1055   125   75  189    96   62  318    42
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  113  401    25   74 1055   125   75  189    96   62  318    42
Added Vol:      0   16     0    0  165     0    0    0     1    0    0     0
Future:        30  305    60   60   70    20   35   20    10   10   40    32
Initial Fut:  143  722    85  134 1290   145  110  209   107   72  358    74
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   143  722    85  134 1290   145  110  209   107   72  358    74
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  143  722    85  134 1290   145  110  209   107   72  358    74
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   143  722    85  134 1290   145  110  209   107   72  358    74
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.93  0.93 0.95 0.94  0.94 0.56 0.56  0.56 0.86 0.86  0.86
Lanes:       1.00 1.79  0.21 1.00 1.80  0.20 0.52 0.98  0.50 0.14 0.71  0.15
Final Sat.:  1805 3178   374 1805 3197   359  549 1043   534  235 1167   241
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.23  0.23 0.07 0.40  0.40 0.20 0.20  0.20 0.31 0.31  0.31
Crit Moves:  ****                  ****                              ****
Green/Cycle: 0.00 0.37  0.00 0.00 0.37  0.00 0.37 0.37  0.37 0.37 0.37  0.37
Volume/Cap:  xxxx 0.61  xxxx xxxx 1.09  xxxx 0.55 0.55  0.55 0.84 0.84  0.84
Delay/Veh:    0.0 27.8   0.0  0.0 84.9   0.0 28.0 28.0  28.0 42.5 42.5  42.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 27.8   0.0  0.0 84.9   0.0 28.0 28.0  28.0 42.5 42.5  42.5
DesignQueue:    8   27     5    8   50     9    4    8     4    3   14     3
******************************************************************************
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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #5 Rose Street / Shattuck Avenue
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.575
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       9.9
Optimal Cycle:       52              Level Of Service:                A
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   17   17    17    17   17    17    27   27    27    27   27    27
Lanes:       1  0  1  1  0    1  0  1  1  0    0  1  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     55  191    11   174  961    28    28  174    40    32  185    40
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  55  191    11   174  961    28    28  174    40    32  185    40
Added Vol:     0    1     0     4   12     0     0    0     0     0    0     0
Future:       40  140    20    10  170    10    10   10    20    20   10    10
Initial Fut:  95  332    31   188 1143    38    38  184    60    52  195    50
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   95  332    31   188 1143    38    38  184    60    52  195    50
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  95  332    31   188 1143    38    38  184    60    52  195    50
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   95  332    31   188 1143    38    38  184    60    52  195    50
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.17 0.94  0.94  0.53 0.95  0.95  0.91 0.91  0.85  0.89 0.89  0.89
Lanes:       1.00 1.83  0.17  1.00 1.94  0.06  0.17 0.83  1.00  0.17 0.66  0.17
Final Sat.:   331 3259   304  1015 3476   116   297 1438  1615   297 1114   286
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.29 0.10  0.10  0.19 0.33  0.33  0.13 0.13  0.04  0.18 0.18  0.18
Crit Moves:                        ****                               ****
Green/Cycle: 0.46 0.46  0.46  0.46 0.46  0.46  0.42 0.42  0.42  0.42 0.42  0.42
Volume/Cap:  0.62 0.22  0.22  0.40 0.71  0.71  0.31 0.31  0.09  0.42 0.42  0.42
Delay/Veh:   23.3  4.8   4.8   7.5  8.7   8.7  13.8 13.8  11.8  15.3 15.3  15.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  23.3  4.8   4.8   7.5  8.7   8.7  13.8 13.8  11.8  15.3 15.3  15.3
DesignQueue:    2    7     1     4   24     1     1    4     1     1    4     1
*******************************************************************************
```



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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #6 Cedar Street / Martin Luther King Way
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.986
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):      33.9
Optimal Cycle:      127              Level Of Service:                C
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   20   20    20    20   20    20    20   20    20    20   20    20
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     33  292    44    35  617    26    14  276    62    58  248    30
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  33  292    44    35  617    26    14  276    62    58  248    30
Added Vol:     0    4     1     0   18     0     0   14     1     4    2     0
Future:       10   40    20    20  220    10    10   50    30    30   90    20
Initial Fut:  43  336    65    55  855    36    24  340    93    92  340    50
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   43  336    65    55  855    36    24  340    93    92  340    50
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  43  336    65    55  855    36    24  340    93    92  340    50
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   43  336    65    55  855    36    24  340    93    92  340    50
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.85 0.85  0.85  0.95 0.95  0.95  0.94 0.94  0.94  0.75 0.75  0.75
Lanes:       0.10 0.76  0.14  0.06 0.90  0.04  0.05 0.75  0.20  0.19 0.71  0.10
Final Sat.:   157 1229   238   105 1632    69    94 1329   363   270  999   147
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.27 0.27  0.27  0.52 0.52  0.52  0.26 0.26  0.26  0.34 0.34  0.34
Crit Moves:                        ****                               ****
Green/Cycle: 0.53 0.53  0.53  0.53 0.53  0.53  0.35 0.35  0.35  0.35 0.35  0.35
Volume/Cap:  0.51 0.51  0.51  0.99 0.99  0.99  0.74 0.74  0.74  0.99 0.99  0.99
Delay/Veh:    9.2  9.2   9.2  36.5 36.5  36.5  26.6 26.6  26.6  58.4 58.4  58.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   9.2  9.2   9.2  36.5 36.5  36.5  26.6 26.6  26.6  58.4 58.4  58.4
DesignQueue:    1    6     1     1   17     1     1    9     2     2    9     1
*******************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Cedar Street / Shattuck Avenue
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.627
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):        10.6
Optimal Cycle:       50               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    20   20    20    20   20    20    22   22    22    22   22    22
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      48  256    41   127  933    52    44  257    86    94  268    56
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   48  256    41   127  933    52    44  257    86    94  268    56
Added Vol:      0    1     0     2   10     0     0   15     0     4    6     0
Future:        20  140    20    10  150    10    10   30    10    40   70    20
Initial Fut:   68  397    61   139 1093    62    54  302    96   138  344    76
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    68  397    61   139 1093    62    54  302    96   138  344    76
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   68  397    61   139 1093    62    54  302    96   138  344    76
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    68  397    61   139 1093    62    54  302    96   138  344    76
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.22 0.93  0.93  0.48 0.94  0.94  0.33 0.96  0.96  0.35 0.97  0.97
Lanes:       1.00 1.73  0.27  1.00 1.89  0.11  1.00 0.76  0.24  1.00 0.82  0.18
Final Sat.:   422 3067   471   920 3389   192   621 1390   442   671 1514   335
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.13  0.13  0.15 0.32  0.32  0.09 0.22  0.22  0.21 0.23  0.23
Crit Moves:                        ****                               ****
Green/Cycle: 0.51 0.51  0.51  0.51 0.51  0.51  0.36 0.36  0.36  0.36 0.36  0.36
Volume/Cap:  0.31 0.25  0.25  0.29 0.63  0.63  0.24 0.60  0.60  0.57 0.63  0.63
Delay/Veh:    6.4  2.9   2.9   4.2  4.9   4.9  17.0 20.9  20.9  25.9 21.5  21.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   6.4  2.9   2.9   4.2  4.9   4.9  17.0 20.9  20.9  25.9 21.5  21.5
DesignQueue:    1    7     1     2   21     1     1    7     2     3    8     2
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Cedar Street / Oxford Street
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        1.030
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        58.2
Optimal Cycle:      178               Level Of Service:                  E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16    16   16    16    16   16    16    16   16    16
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      45  186    56    34  531    19    18  314    75   144  343    19
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   45  186    56    34  531    19    18  314    75   144  343    19
Added Vol:      2   13     0     0  115     9     1    0    16     0    0     0
Future:        30   20    10    10   10     0    10   40    30    10  120     0
Initial Fut:   77  219    66    44  656    28    29  354   121   154  463    19
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    77  219    66    44  656    28    29  354   121   154  463    19
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   77  219    66    44  656    28    29  354   121   154  463    19
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    77  219    66    44  656    28    29  354   121   154  463    19
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.76 0.76  0.76  0.96 0.96  0.96  0.92 0.92  0.92  0.67 0.67  0.67
Lanes:       0.21 0.61  0.18  0.06 0.90  0.04  0.06 0.70  0.24  0.24 0.73  0.03
Final Sat.:   306  871   262   110 1639    70   101 1234   422   306  920    38
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.25 0.25  0.25  0.40 0.40  0.40  0.29 0.29  0.29  0.50 0.50  0.50
Crit Moves:                        ****                               ****
Green/Cycle: 0.50 0.49  0.49  0.50 0.50  0.50  0.40 0.39  0.39  0.40 0.40  0.40
Volume/Cap:  0.50 0.51  0.51  0.80 0.80  0.80  0.73 0.75  0.75  1.27 1.27  1.27
Delay/Veh:   10.8 11.5  11.5  17.7 17.7  17.7  23.2 24.6  24.6 157.8  158 157.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  10.8 11.5  11.5  17.7 17.7  17.7  23.2 24.6  24.6 157.8  158 157.8
DesignQueue:    1    4     1     1   13     1     1    8     3     4   11     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                            AM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
         2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Cedar Street / Euclid Avenue
********************************************************************************
Cycle (sec):        60              Critical Vol./Cap. (X):        0.599
Loss Time (sec):     8 (Y+R =  5 sec) Average Delay (sec/veh):       13.8
Optimal Cycle:      42              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   17   17    17   17   17    17   17   17    17   17   17    17
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      30   85    29   23  295   141   50  143   117   28  209     8
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   30   85    29   23  295   141   50  143   117   28  209     8
Added Vol:      0    0     0    0   11     3    0   -2     0    0    0     0
Future:        20    0     0    0   10    40   10   30    20   20   80     0
Initial Fut:   50   85    29   23  316   184   60  171   137   48  289     8
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    50   85    29   23  316   184   60  171   137   48  289     8
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   50   85    29   23  316   184   60  171   137   48  289     8
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    50   85    29   23  316   184   60  171   137   48  289     8
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.78 0.78  0.78 0.94 0.94  0.94 0.86 0.86  0.86 0.92 0.92  0.92
Lanes:       0.30 0.52  0.18 0.04 0.61  0.35 0.16 0.47  0.37 0.14 0.84  0.02
Final Sat.:   452  769   262   78 1076   627  266  759   608  242 1457    40
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.11  0.11 0.29 0.29  0.29 0.23 0.23  0.23 0.20 0.20  0.20
Crit Moves:                       ****             ****
Green/Cycle: 0.49 0.49  0.49 0.49 0.49  0.49 0.38 0.38  0.38 0.38 0.38  0.38
Volume/Cap:  0.23 0.23  0.23 0.60 0.60  0.60 0.60 0.60  0.60 0.53 0.53  0.53
Delay/Veh:    8.9  8.9   8.9 12.2 12.2  12.2 16.7 16.7  16.7 15.4 15.4  15.4
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   8.9  8.9   8.9 12.2 12.2  12.2 16.7 16.7  16.7 15.4 15.4  15.4
DesignQueue:    1    1     1    0    6     3    1    4     3    1    6     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                            AM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
         2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Grizzly Peak Blvd / Centennial Drive
********************************************************************************
Cycle (sec):       100              Critical Vol./Cap. (X):        0.503
Loss Time (sec):     0 (Y+R =  4 sec) Average Delay (sec/veh):       11.5
Optimal Cycle:       0              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 7:00-9:00 AM
Base Vol:      31   13    13   25   52     4    6  165   143  169   90    16
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   31   13    13   25   52     4    6  165   143  169   90    16
Added Vol:      1    0     4    0    0     0    0    0     9   48    0     0
Future:        33    0    11    0    0     0    0   22    11   22   11     0
Initial Fut:   65   13    28   25   52     4    6  187   163  239  101    16
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    65   13    28   25   52     4    6  187   163  239  101    16
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   65   13    28   25   52     4    6  187   163  239  101    16
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    65   13    28   25   52     4    6  187   163  239  101    16
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.62 0.12  0.26 0.31 0.64  0.05 0.02 0.52  0.46 0.68 0.28  0.04
Final Sat.:   353   71   152  172  359    28   13  398   347  475  201    32
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.18  0.18 0.14 0.14  0.14 0.47 0.47  0.47 0.50 0.50  0.50
Crit Moves:  ****                 ****        ****                  ****
Delay/Veh:    9.7  9.7   9.7  9.6  9.6   9.6 11.4 11.4  11.4 12.6 12.6  12.6
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   9.7  9.7   9.7  9.6  9.6   9.6 11.4 11.4  11.4 12.6 12.6  12.6
LOS by Move:    A    A     A    A    A     A    B    B     B    B    B     B
ApproachDel:       9.7              9.6             11.4             12.6
Delay Adj:        1.00             1.00             1.00             1.00
ApprAdjDel:        9.7              9.6             11.4             12.6
LOS by Appr:        A                A                B                B
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #11 Hearst Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.534
Loss Time (sec):      8 (Y+R =  6 sec) Average Delay (sec/veh):        8.4
Optimal Cycle:       52              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   22   22    22   22   22    22   22   22    22   22   22    22
Lanes:       1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     19  291    43  199  810    57   31  278    24   11  225    51
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  19  291    43  199  810    57   31  278    24   11  225    51
Added Vol:     3    1   -13    4   11     0    0   40    25   10    5     0
Future:       11   99    22   55  176    22   33   33    33   11   22    77
Initial Fut:  33  391    52  258  997    79   64  351    82   32  252   128
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   33  391    52  258  997    79   64  351    82   32  252   128
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  33  391    52  258  997    79   64  351    82   32  252   128
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   33  391    52  258  997    79   64  351    82   32  252   128
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.26 0.93  0.93 0.49 0.94  0.94 0.78 0.78  0.78 0.80 0.80  0.80
Lanes:       1.00 1.77  0.23 1.00 1.85  0.15 0.26 1.41  0.33 0.16 1.22  0.62
Final Sat.:   500 3129   416  935 3308   262  383 2103   491  238 1871   950
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.12  0.12 0.28 0.30  0.30 0.17 0.17  0.17 0.13 0.13  0.13
Crit Moves:                       ****             ****
Green/Cycle: 0.54 0.54  0.54 0.54 0.54  0.54 0.34 0.34  0.34 0.34 0.34  0.34
Volume/Cap:  0.12 0.23  0.23 0.51 0.56  0.56 0.49 0.49  0.49 0.40 0.40  0.40
Delay/Veh:    2.6  2.0   2.0  5.8  3.4   3.4 18.8 18.8  18.8 17.6 17.6  17.6
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   2.6  2.0   2.0  5.8  3.4   3.4 18.8 18.8  18.8 17.6 17.6  17.6
DesignQueue:    1    7     1    4   18     1    2    9     2    1    6     3
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Hearst Avenue / Oxford Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.561
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       11.8
Optimal Cycle:       49              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   19   19    19   19   19    19   22   22    22   22   22    22
Lanes:       1  0  1  1  0   0  1  0  1  0   0  1  0  1  0   1  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     46  328   374   48  841    38   10  399   114  207  281    27
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  46  328   374   48  841    38   10  399   114  207  281    27
Added Vol:     0   59    91    4   99     3   19   14    -1   10   12    19
Future:       22   55    44   11   33    22    0   88    33   33   77    11
Initial Fut:  68  442   509   63  973    63   29  501   146  250  370    57
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   68  442   509   63  973    63   29  501   146  250  370    57
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  68  442   509   63  973    63   29  501   146  250  370    57
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   68  442   509   63  973    63   29  501   146  250  370    57
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 1.00 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
Lanes:       1.00 1.00  1.00 0.11 1.78  0.11 0.09 1.48  0.43 1.11 1.64  0.25
Final Sat.:  1900 1805  1805  207 3196   207  155 2675   780 2000 2959   456
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.24  0.28 0.30 0.30  0.30 0.19 0.19  0.19 0.13 0.13  0.13
Crit Moves:                       ****             ****
Green/Cycle: 0.54 0.54  0.54 0.54 0.54  0.54 0.34 0.34  0.34 0.34 0.34  0.34
Volume/Cap:  0.07 0.45  0.52 0.57 0.57  0.57 0.55 0.55  0.55 0.37 0.37  0.37
Delay/Veh:    5.2  7.2   7.9  8.2  8.2   8.2 19.3 19.3  19.3 16.8 16.8  16.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   5.2  7.2   7.9  8.2  8.2   8.2 19.3 19.3  19.3 16.8 16.8  16.8
DesignQueue:    1    8     9    1   18     1    1   13     4    6    9     1
********************************************************************************
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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #13 Hearst Avenue / Spruce Street
*******************************************************************************
Average Delay (sec/veh):      0.8         Worst Case Level Of Service:       B
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  1  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0    9    0    63    11  843     0     0  430     7
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    9    0    63    11  843     0     0  430     7
Added Vol:      0    0     0    7    0     0     0  109     0     0   42     1
Future:         0    0     0    0    0    20     0  130     0     0  110     0
Initial Fut:    0    0     0   16    0    83    11 1082     0     0  582     8
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   16    0    83    11 1082     0     0  582     8
Reduct Vol:     0    0     0    0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0   16    0    83    11 1082     0     0  582     8
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx  6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx  3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1149 xxxx   295   590 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   195 xxxx   707   995 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   193 xxxx   707   995 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.7 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  495 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 14.1 xxxxx   8.7 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            14.1             xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```



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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #14 Hearst Avenue / Arch Street / Le Conte Avenue
*******************************************************************************
Average Delay (sec/veh):      3.0         Worst Case Level Of Service:       B
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0    2    0   130   276  566     0     0  307     4
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    2    0   130   276  566     0     0  307     4
Added Vol:      0    0     0    0    0     0    24   93     0     0   43     0
Future:         0    0     0    0    0    40    30  100     0     0   90     0
Initial Fut:    0    0     0    2    0   170   330  759     0     0  440     4
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    2    0   170   330  759     0     0  440     4
Reduct Vol:     0    0     0    0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0    2    0   170   330  759     0     0  440     4
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx  6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx  3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1482 xxxx   222   444 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   118 xxxx   788  1127 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx    91 xxxx   788  1127 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.5 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  724 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            11.5             xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #15 Hearst Avenue / Scenic Avenue
********************************************************************************
Average Delay (sec/veh):      0.5          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  0  0  1    0  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:       0    0     0     0    0    37     0  531     0     0  290    55
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0    0    37     0  531     0     0  290    55
Added Vol:      0    0     0     0    0     1     0    0     0     0   42     2
Future:         0    0     0     0    0    20     0  100     0     0   90    10
Initial Fut:    0    0     0     0    0    58     0  631     0     0  422    67
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0     0    0    58     0  631     0     0  422    67
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0     0    0    58     0  631     0     0  422    67
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx   245  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx   762  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx   762  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx  10.1 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     B     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx             10.1            xxxxxx           xxxxxx
ApproachLOS:        *                 B                *                *
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Hearst Avenue / Euclid Avenue
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.623
Loss Time (sec):     12 (Y+R =  3 sec) Average Delay (sec/veh):        19.2
Optimal Cycle:       53               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    25   25    25     5   16    16    16   16    16
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  0  1  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00-9:00 AM
Base Vol:       2    0     2    47    1   151    75  448     1     1  276    10
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    2    0     2    47    1   151    75  448     1     1  276    10
Added Vol:      0    0     0     3    0     3     0   93     0     0   49     0
Future:         0    0     0    11    0    55    11   99     0     0   77     0
Initial Fut:    2    0     2    61    1   209    86  640     1     1  402    10
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     2    0     2    61    1   209    86  640     1     1  402    10
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    2    0     2    61    1   209    86  640     1     1  402    10
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     2    0     2    61    1   209    86  640     1     1  402    10
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.87 1.00  0.87  0.84 0.84  0.84  0.63 1.00  1.00  1.00 1.00  1.00
Lanes:       0.50 0.00  0.50  0.22 0.01  0.77  1.00 0.99  0.01  0.01 0.97  0.02
Final Sat.:   825    0   825   358    6  1226  1201 1897     3     5 1844    46
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.17 0.17  0.17  0.07 0.34  0.34  0.22 0.22  0.22
Crit Moves:                        ****                ****
Green/Cycle: 0.38 0.00  0.38  0.38 0.38  0.38  0.43 0.43  0.43  0.43 0.43  0.43
Volume/Cap:  0.01 0.00  0.01  0.44 0.44  0.44  0.17 0.78  0.78  0.51 0.51  0.51
Delay/Veh:   12.4  0.0  12.4  17.2 17.2  17.2  12.0 23.3  23.3  15.7 15.7  15.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  12.4  0.0  12.4  17.2 17.2  17.2  12.0 23.3  23.3  15.7 15.7  15.7
DesignQueue:    0    0     0     1    0     5     2   14     0     0    9     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #17 Hearst Avenue / Le Roy Avenue
********************************************************************************
Average Delay (sec/veh):      1.6          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:       0    0     0   19    0    60   59  436     0     0  230     3
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   19    0    60   59  436     0     0  230     3
Added Vol:      0    0     0    0    0     0    0   96     0     0   49     0
Future:         0    0     0    0    0    10   10   90     0     0   70     0
Initial Fut:    0    0     0   19    0    70   69  622     0     0  349     3
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   19    0    70   69  622     0     0  349     3
Reduct Vol:     0    0     0    0    0     0    0    0     0     0    0     0
Final Vol.:     0    0     0   19    0    70   69  622     0     0  349     3
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx  6.4 xxxx   6.2  4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx  3.5 xxxx   3.3  2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  815 xxxx   351  352 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  244 xxxx   697 1218 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  233 xxxx   697 1218 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  8.1 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *    *    *     *    A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  489 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 14.0 xxxxx  8.1 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *    *    B     *    A    *     *     *    *     *
ApproachDel:      xxxxxx            14.0            xxxxxx           xxxxxx
ApproachLOS:        *                 B                *                *
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #18 Hearst Avenue / Gayley Road / LaLoma Avenue
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        1.263
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       71.7
Optimal Cycle:      180               Level Of Service:                  E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18   18   18    18   17   17    17   17   17    17
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 7:00-9:00 AM
Base Vol:     274  212    95   12  274    21   28  161   304   21   33     5
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  274  212    95   12  274    21   28  161   304   21   33     5
Added Vol:     33    3    57    0   38     0    0   58    38    3   16     0
Future:        77   11    22    0  132     0    0   88     0   22   22     0
Initial Fut:  384  226   174   12  444    21   28  307   342   46   71     5
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   384  226   174   12  444    21   28  307   342   46   71     5
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  384  226   174   12  444    21   28  307   342   46   71     5
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   384  226   174   12  444    21   28  307   342   46   71     5
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.57 0.57  0.57 0.98 0.98  0.98 0.92 0.92  0.92 0.75 0.75  0.85
Lanes:       0.49 0.29  0.22 0.03 0.93  0.04 0.04 0.45  0.51 0.39 0.61  1.00
Final Sat.:   533  314   242   47 1725    82   72  793   883  560  865  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.72 0.72  0.72 0.26 0.26  0.26 0.39 0.39  0.39 0.08 0.08  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.55 0.55  0.55 0.55 0.55  0.55 0.40 0.40  0.00 0.40 0.40  0.40
Volume/Cap:  1.30 1.30  1.30 0.46 0.46  0.46 0.97 0.97  xxxx 0.21 0.21  0.01
Delay/Veh:  161.3  161 161.3 10.2 10.2  10.2 44.2 44.2   0.0 12.2 12.2  10.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 161.3  161 161.3 10.2 10.2  10.2 44.2 44.2   0.0 12.2 12.2  10.5
DesignQueue:    7    4     3    0    8     0    1    7    14    1    2     0
********************************************************************************
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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #19 Berkeley Way / Oxford Street
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.518
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        7.1
Optimal Cycle:       46              Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    20   20    20    20   20    20
Lanes:        1  0  1  1  0    1  0  1  1  0    0  0  1! 0  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      39  717    40    30 1132    11    20   18    72    10    2    12
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   39  717    40    30 1132    11    20   18    72    10    2    12
Added Vol:     38  147     0     0   83    26     3    0     4     0    0     0
PasserByVol:   10  110    10     0  100     0     0    0    20     0    0     0
Initial Fut:   87  974    50    30 1315    37    23   18    96    10    2    12
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    87  974    50    30 1315    37    23   18    96    10    2    12
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   87  974    50    30 1315    37    23   18    96    10    2    12
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    87  974    50    30 1315    37    23   18    96    10    2    12
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.16 0.94  0.94  0.26 0.95  0.95  0.87 0.87  0.87  0.85 0.87  0.87
Lanes:       1.00 1.90  0.10  1.00 1.95  0.05  0.17 0.13  0.70  1.00 0.14  0.86
Final Sat.:   312 3410   175   494 3497    98   277  217  1157  1621  236  1418
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.28 0.29  0.29  0.06 0.38  0.38  0.08 0.08  0.08  0.01 0.01  0.01
Crit Moves:                        ****             ****
Green/Cycle: 0.60 0.60  0.60  0.60 0.60  0.60  0.29 0.29  0.29  0.29 0.29  0.29
Volume/Cap:  0.47 0.48  0.48  0.10 0.63  0.63  0.29 0.29  0.29  0.02 0.03  0.03
Delay/Veh:   12.6  5.3   5.3   4.1  6.5   6.5  21.0 21.0  21.0  18.1 18.1  18.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  12.6  5.3   5.3   4.1  6.5   6.5  21.0 21.0  21.0  18.1 18.1  18.1
DesignQueue:    1   16     1     0   23     1     1    1     3     0    0     0
********************************************************************************
```



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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #20 University Avenue / Sixth Street
********************************************************************************
Cycle (sec):        114              Critical Vol./Cap. (X):        1.002
Loss Time (sec):     16 (Y+R =  5 sec) Average Delay (sec/veh):      101.8
Optimal Cycle:      180              Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Prot+Permit       Permitted        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     6   23    23     0   23    23     6   15    15     6   15    15
Lanes:        1  0  1  0  1    1  0  1  0  1    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     211  111    19    73  290   325    89  932   333    40  931    21
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  211  111    19    73  290   325    89  932   333    40  931    21
Added Vol:      0   17    12     0    4     1     6  303     0     1   32     0
Future:       150   60    10    10   10    80    10   60    40    10  150    10
Initial Fut:  361  188    41    83  304   406   105 1295   373    51 1113    31
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   361  188    41    83  304   406   105 1295   373    51 1113    31
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  361  188    41    83  304   406   105 1295   373    51 1113    31
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   361  188    41    83  304   406   105 1295   373    51 1113    31
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.98 1.00  0.85  1.00 1.00  0.85  0.95 0.92  0.92  0.95 0.95  0.95
Lanes:       1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.55  0.45  1.00 1.95  0.05
Final Sat.:  1858 1900  1615  1900 1900  1615  1805 2707   780  1805 3498    97
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.10  0.03  0.04 0.16  0.25  0.06 0.48  0.48  0.03 0.32  0.32
Crit Moves:  ****                        ****        ****        ****
Green/Cycle: 0.44 0.44  0.44  0.25 0.25  0.25  0.06 0.37  0.37  0.05 0.35  0.35
Volume/Cap:  0.44 0.22  0.06  0.18 0.65  1.02  0.90 1.31  1.31  0.54 0.90  0.90
Delay/Veh:   47.8 20.4  18.5  34.8 45.6  94.7 112.1  179 179.2  72.7 45.0  45.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  47.8 20.4  18.5  34.8 45.6  94.7 112.1  179 179.2  72.7 45.0  45.0
DesignQueue:   19    7     1     4   15    21     6   59    17     3   49     1
********************************************************************************
```

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--------------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #21 University Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):       114              Critical Vol./Cap. (X):        0.971
Loss Time (sec):    16 (Y+R =  5 sec) Average Delay (sec/veh):      132.2
Optimal Cycle:     172              Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    5   21    21    5   21    21    5   22    22    5   22    22
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     100  457    75   190  837    83    56  957    49    63  644    93
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  100  457    75   190  837    83    56  957    49    63  644    93
Added Vol:      0    3     7    83   50     0     0  315     1     1   33    10
Future:        50  200    40    60   30    20    10   60    10    10  120   100
Initial Fut:  150  660   122   333  917   103    66 1332    60    74  797   203
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   150  660   122   333  917   103    66 1332    60    74  797   203
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  150  660   122   333  917   103    66 1332    60    74  797   203
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   150  660   122   333  917   103    66 1332    60    74  797   203
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.94  0.94  0.95 0.94  0.94  0.95 0.92  0.92
Lanes:       1.00 1.69  0.31  1.00 1.80  0.20  1.00 1.91  0.09  1.00 1.59  0.41
Final Sat.:  1805 2977   550  1805 3197   359  1805 3434   155  1805 2791   711
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.22  0.22  0.18 0.29  0.29  0.04 0.39  0.39  0.04 0.29  0.29
Crit Moves:       ****        ****                  ****        ****
Green/Cycle: 0.13 0.28  0.28  0.29 0.44  0.44  0.04 0.25  0.25  0.04 0.25  0.25
Volume/Cap:  0.65 0.79  0.79  0.65 0.65  0.65  0.83 1.55  1.55  0.93 1.14  1.14
Delay/Veh:   61.0 44.5  44.5  41.8 27.3  27.3 116.3  297 296.5 138.5  120 120.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  61.0 44.5  44.5  41.8 27.3  27.3 116.3  297 296.5 138.5  120 120.4
DesignQueue:    8   32     6    16   35     4     4   70     3     5   41    10
********************************************************************************
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--------------------------------------------------------------------------------
                         365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #22 University Avenue / Martin Luther King Way
********************************************************************************
Cycle (sec):        65              Critical Vol./Cap. (X):        1.026
Loss Time (sec):    12 (Y+R =  5 sec) Average Delay (sec/veh):       42.3
Optimal Cycle:     180              Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    5   23    23   23   23    23   17   17    17   17   17    17
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     178  568    80    57  833    87    81  703   185    41  477    47
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  178  568    80    57  833    87    81  703   185    41  477    47
Added Vol:      1    3     3     0   14     0     2  409    -2     0   42     0
Future:        70    0     0     0  230    30    10  130    20    20  160    80
Initial Fut:  249  571    83    57 1077   117    93 1242   203    61  679   127
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   249  571    83    57 1077   117    93 1242   203    61  679   127
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  249  571    83    57 1077   117    93 1242   203    61  679   127
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   249  571    83    57 1077   117    93 1242   203    61  679   127
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.99 0.93  0.93  1.00 0.94  0.94  0.17 0.93  0.93  1.00 0.93  0.93
Lanes:       1.00 1.75  0.25  1.00 1.80  0.20  1.00 1.72  0.28  1.00 1.68  0.32
Final Sat.:  1880 3092   449  1900 3207   348   315 3038   496  1900 2968   555
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.18  0.18  0.03 0.34  0.34  0.29 0.41  0.41  0.03 0.23  0.23
Crit Moves:  ****                  ****              ****
Green/Cycle: 0.45 0.45  0.45  0.35 0.35  0.35  0.37 0.37  0.37  0.37 0.37  0.37
Volume/Cap:  0.30 0.41  0.41  0.08 0.95  0.95  0.80 1.11  1.11  0.09 0.62  0.62
Delay/Veh:   26.1 11.1  11.1  13.4 35.0  35.0  59.9 79.4  79.4  13.6 18.9  18.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.1 11.1  11.1  13.4 35.0  35.0  59.9 79.4  79.4  13.6 18.9  18.9
DesignQueue:    8   12     2     1   27     3     2   31     5     1   16     3
********************************************************************************
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Cum+UC Proj+25 Inc Var+LBNLWed May 12, 2004 10:50:26            Page 31-1
------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #23 University Avenue / Milvia Street
******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.683
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       14.3
Optimal Cycle:       49              Level Of Service:                 B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   21   21    21    21   21    21    20   20    20    20   20    20
Lanes:       1  0  0  1  0    0  0  1! 0  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     100   98    21     6  203    63    37  656   137    18  406    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  100   98    21     6  203    63    37  656   137    18  406    15
Added Vol:      0    0     0     0    0     0     0  413     0     0   43     0
Future:        10   10    10    10   10    10    20   80    20    20  240    20
Initial Fut:  110  108    31    16  213    73    57 1149   157    38  689    35
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   110  108    31    16  213    73    57 1149   157    38  689    35
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  110  108    31    16  213    73    57 1149   157    38  689    35
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   110  108    31    16  213    73    57 1149   157    38  689    35
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.73 0.97  0.97  0.95 0.95  0.95  0.83 0.83  0.83  0.79 0.79  0.79
Lanes:       1.00 0.78  0.22  0.05 0.71  0.24  0.08 1.69  0.23  0.10 1.81  0.09
Final Sat.:  1391 1428   410    96 1276   437   132 2659   363   149 2706   137
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.08  0.08  0.17 0.17  0.17  0.43 0.43  0.43  0.25 0.25  0.25
Crit Moves:                        ****              ****
Green/Cycle: 0.32 0.32  0.32  0.32 0.32  0.32  0.55 0.55  0.55  0.55 0.55  0.55
Volume/Cap:  0.24 0.23  0.23  0.52 0.52  0.52  0.78 0.78  0.78  0.46 0.46  0.46
Delay/Veh:   17.5 17.0  17.0  21.1 21.1  21.1  14.9 14.9  14.9   9.6  9.6   9.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  17.5 17.0  17.0  21.1 21.1  21.1  14.9 14.9  14.9   9.6  9.6   9.6
DesignQueue:    3    3     1     0    5     2     1   20     3     1   12     1
******************************************************************************
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Cum+UC Proj+25 Inc Var+LBNLWed May 12, 2004 10:50:26            Page 32-1
------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #24 University Avenue / SB Shattuck Avenue
******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.679
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       40.9
Optimal Cycle:       44              Level Of Service:                 D
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    16   16    16    16   16    16    16   16    16
Lanes:       0  0  0  0  0    0  1  1  1  0    1  0  1  1  0    0  1  0  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0    49  767   105   115  401   162    26  356   314
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    49  767   105   115  401   162    26  356   314
Added Vol:      0    0     0     0   19     6    55  234   124     0   37    36
Future:         0    0     0    11  132    66    22   55    11    11  220    99
Initial Fut:    0    0     0    60  918   177   192  690   297    37  613   449
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    60  918   177   192  690   297    37  613   449
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0    60  918   177   192  690   297    37  613   449
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    0     0    60  918   177   192  690   297    37  613   449
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.78 0.78  0.78  0.29 0.82  0.82  0.70 0.70  0.70
Lanes:       0.00 0.00  0.00  0.16 2.38  0.46  1.00 1.40  0.60  0.10 1.67  1.23
Final Sat.:     0    0     0   231 3542   683   552 2169   934   134 2216  1623
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.26 0.26  0.26  0.35 0.32  0.32  0.28 0.28  0.28
Crit Moves:                        ****        ****
Green/Cycle: 0.00 0.00  0.00  0.36 0.36  0.36  0.30 0.30  0.30  0.00 0.53  0.53
Volume/Cap:  0.00 0.00  0.00  0.72 0.72  0.72  1.16 1.06  1.06  xxxx 0.52  0.52
Delay/Veh:    0.0  0.0   0.0  23.6 23.6  23.6 145.3 73.1  73.1   0.0 12.4  12.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  23.6 23.6  23.6 145.3 73.1  73.1   0.0 12.4  12.4
DesignQueue:    0    0     0     2   26     5     6   22     9     2   13     9
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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #25 University Avenue / NB Shattuck Avenue
********************************************************************************
Cycle (sec):        75              Critical Vol./Cap. (X):        0.481
Loss Time (sec):    15 (Y+R =  4 sec) Average Delay (sec/veh):      17.0
Optimal Cycle:      47              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:         Include          Include          Include          Include
Min. Green:   19    0    19    0    0     0    0   13     0    0   13     0
Lanes:       2  0  1! 0  1   0  0  0  0  0   0  0  2  0  0   0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     458    0   168    0    0     0    0  444     0    0  235     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  458    0   168    0    0     0    0  444     0    0  235     0
Added Vol:     53    0    38    0    0     0    0  234     0    0   20     0
Future:       220    0    20    0    0     0    0    0     0    0   80     0
Initial Fut:  731    0   226    0    0     0    0  678     0    0  335     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   731    0   226    0    0     0    0  678     0    0  335     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  731    0   226    0    0     0    0  678     0    0  335     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   731    0   226    0    0     0    0  678     0    0  335     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.81 1.00  0.84 1.00 1.00  1.00 1.00 0.86  1.00 1.00 0.86  1.00
Lanes:       2.69 0.00  1.31 0.00 0.00  0.00 0.00 2.00  0.00 0.00 2.00  0.00
Final Sat.:  4146    0  2082    0    0     0    0 3249     0    0 3249     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.00  0.11 0.00 0.00  0.00 0.00 0.21  0.00 0.00 0.10  0.00
Crit Moves:  ****                                 ****       ****
Green/Cycle: 0.37 0.00  0.37 0.00 0.00  0.00 0.00 0.43  0.00 0.00 0.43  0.00
Volume/Cap:  0.48 0.00  0.30 0.00 0.00  0.00 0.00 0.48  0.00 0.00 0.24  0.00
Delay/Veh:   19.1  0.0  17.1  0.0  0.0   0.0  0.0 16.4   0.0  0.0 13.8   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  19.1  0.0  17.1  0.0  0.0   0.0  0.0 16.4   0.0  0.0 13.8   0.0
DesignQueue:   20    0     6    0    0     0    0   17     0    0    8     0
********************************************************************************
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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #26 University Avenue / Oxford Street
********************************************************************************
Cycle (sec):        65              Critical Vol./Cap. (X):        0.942
Loss Time (sec):    12 (Y+R =  4 sec) Average Delay (sec/veh):      40.5
Optimal Cycle:     134              Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Prot+Permit       Permitted        Permitted        Permitted
Rights:         Include          Include          Include          Include
Min. Green:    5   18    18    5   18    18   18   18    18   18   18    18
Lanes:       1  0  1  1  0   1  0  1  1  0   1  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     147  487     4   41 1101    77  300   38   217    6   12    23
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  147  487     4   41 1101    77  300   38   217    6   12    23
Added Vol:     10   54    -2   -3   79    11  132   -6   147    0   -1     0
Future:        55   99     0   11   88    33   22   11    22    0   11    11
Initial Fut:  212  640     2   49 1268   121  454   43   386    6   22    34
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   212  640     2   49 1268   121  454   43   386    6   22    34
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  212  640     2   49 1268   121  454   43   386    6   22    34
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   212  640     2   49 1268   121  454   43   386    6   22    34
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.86 0.86  0.86 0.32 0.84  0.84 0.64 0.64  0.77 0.82 0.82  0.82
Lanes:       1.00 1.99  0.01 1.00 1.83  0.17 1.83 0.17  1.00 0.10 0.35  0.55
Final Sat.:  1625 3239    10  599 2927   279 2221  210  1454  150  552   853
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.20  0.20 0.08 0.43  0.43 0.20 0.20  0.27 0.04 0.04  0.04
Crit Moves:  ****                  ****                  ****
Green/Cycle: 0.41 0.41  0.41 0.41 0.41  0.41 0.30 0.30  0.30 0.30 0.30  0.30
Volume/Cap:  0.32 0.48  0.48 0.20 1.06  1.06 0.68 0.68  0.89 0.13 0.13  0.13
Delay/Veh:   14.4 15.5  15.5 14.3 62.5  62.5 25.1 25.1  43.9 17.2 17.2  17.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  14.4 15.5  15.5 14.3 62.5  62.5 25.1 25.1  43.9 17.2 17.2  17.2
DesignQueue:    5   14     0    1   30     3   12    1    10    0    1     1
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #27 Univeristy Drive (East Gate)  / Gayley Road
********************************************************************************
Average Delay (sec/veh):      3.9          Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Rights:           Include          Include          Include           Include
Lanes:        1  0  1  0  0    0  0  0  1  0    1  0  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:      69  476     0     0  543    75    53    0    73     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   69  476     0     0  543    75    53    0    73     0    0     0
Added Vol:    -13   95     0     0  100   -21    -2    0    -1     0    0     0
Future:        20   70     0     0  110    10    10    0    20     0    0     0
Initial Fut:   76  641     0     0  753    64    61    0    92     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    76  641     0     0  753    64    61    0    92     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    76  641     0     0  753    64    61    0    92     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  817 xxxx xxxxx  xxxx xxxx xxxxx  1578 xxxx   785  xxxx xxxx xxxxx
Potent Cap.:  820 xxxx xxxxx  xxxx xxxx xxxxx   122 xxxx   396  xxxx xxxx xxxxx
Move Cap.:    820 xxxx xxxxx  xxxx xxxx xxxxx   113 xxxx   396  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.8 xxxx xxxxx xxxxx xxxx xxxxx  69.1 xxxx  16.8 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     F    *     C     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             37.7            xxxxxx
ApproachLOS:        *                *                 E                *
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #28 Addison Street / Oxford Street
********************************************************************************
Average Delay (sec/veh):      1.3          Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Rights:           Include          Include          Include           Include
Lanes:        1  0  2  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      54  647     0     0 1165    61     4    0    31     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   54  647     0     0 1165    61     4    0    31     0    0     0
Added Vol:     20   60     0     0  207    18     2    0     2     0    0     0
PasserByVol:   20  140     0     0   90    10     0    0    10     0    0     0
Initial Fut:   94  847     0     0 1462    89     6    0    43     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:   103  931     0     0 1607    98     7    0    47     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   103  931     0     0 1607    98     7    0    47     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1286 xxxx xxxxx  xxxx xxxx xxxxx  2107 xxxx   141  xxxx xxxx xxxxx
Potent Cap.:  407 xxxx xxxxx  xxxx xxxx xxxxx    34 xxxx   661  xxxx xxxx xxxxx
Move Cap.:    407 xxxx xxxxx  xxxx xxxx xxxxx    27 xxxx   661  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 16.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    C    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  171 xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 35.5 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    E     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             35.5            xxxxxx
ApproachLOS:        *                *                 E                *
```

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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #29 Center Street / SB Shattuck Avenue
********************************************************************************
Cycle (sec):          65                Critical Vol./Cap. (X):         0.450
Loss Time (sec):      12 (Y+R =  9 sec) Average Delay (sec/veh):         16.9
Optimal Cycle:        65                Level Of Service:                   B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0   20   20    20    0   22    22   33   33     0
Lanes:       0  0  0  0  0    0  1  1  1  0    0  0  0  1  0    0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0     0   15  779    71    0   69    51   17  102     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0   15  779    71    0   69    51   17  102     0
Added Vol:     0    0     0    0   87     0    0    2     0    0    0     0
Future:        0    0     0    0  130    20    0   50    30   30   40     0
Initial Fut:   0    0     0   15  996    91    0  121    81   47  142     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0     0   15  996    91    0  121    81   47  142     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0   15  996    91    0  121    81   47  142     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0   15  996    91    0  121    81   47  142     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.80 0.80  0.80 1.00 0.85  0.85 0.80 0.80  1.00
Lanes:       0.00 0.00  0.00 0.04 2.71  0.25 0.00 0.60  0.40 0.25 0.75  0.00
Final Sat.:    0    0     0   62 4119   376    0  969   649  377 1138     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.24 0.24  0.24 0.00 0.12  0.12 0.12 0.12  0.00
Crit Moves:                       ****             ****
Green/Cycle: 0.00 0.00  0.00 0.31 0.31  0.31 0.00 0.34  0.34 0.51 0.51  0.00
Volume/Cap:  0.00 0.00  0.00 0.79 0.79  0.79 0.00 0.37  0.37 0.25 0.25  0.00
Delay/Veh:    0.0  0.0   0.0 19.0 19.0  19.0  0.0 18.2  18.2  3.6  3.6   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 19.0 19.0  19.0  0.0 18.2  18.2  3.6  3.6   0.0
DesignQueue:   0    0     0    0   26     2    0    3     2    1    3     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #30 Center Street / NB Shattuck Avenue
********************************************************************************
Cycle (sec):          65                Critical Vol./Cap. (X):         0.399
Loss Time (sec):       8 (Y+R =  9 sec) Average Delay (sec/veh):          5.3
Optimal Cycle:        60                Level Of Service:                   A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   30   30    30    0    0     0   22   22     0    0   22    22
Lanes:       0  1  1  1  0    0  0  0  0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     42  616    51    0    0     0   26   56     0    0   77    26
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  42  616    51    0    0     0   26   56     0    0   77    26
Added Vol:     0  107    -2    0    0     0    0    2     0    0    0     0
Future:       30  200    60    0    0     0   10   40     0    0   40    30
Initial Fut:  72  923   109    0    0     0   36   98     0    0  117    56
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   72  923   109    0    0     0   36   98     0    0  117    56
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  72  923   109    0    0     0   36   98     0    0  117    56
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   72  923   109    0    0     0   36   98     0    0  117    56
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.79 0.79  0.79 1.00 1.00  1.00 0.79 0.79  1.00 1.00 0.86  0.86
Lanes:       0.19 2.51  0.30 0.00 0.00  0.00 0.27 0.73  0.00 0.00 0.68  0.32
Final Sat.:   295 3787   447    0    0     0  405 1103     0    0 1106   529
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.24  0.24 0.00 0.00  0.00 0.09 0.09  0.00 0.00 0.11  0.11
Crit Moves:       ****                                             ****
Green/Cycle: 0.54 0.54  0.54 0.00 0.00  0.00 0.34 0.34  0.00 0.00 0.34  0.34
Volume/Cap:  0.45 0.45  0.45 0.00 0.00  0.00 0.26 0.26  0.00 0.00 0.31  0.31
Delay/Veh:    2.6  2.6   2.6  0.0  0.0   0.0 11.5 11.5   0.0  0.0 17.4  17.4
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   2.6  2.6   2.6  0.0  0.0   0.0 11.5 11.5   0.0  0.0 17.4  17.4
DesignQueue:   1   16     2    0    0     0    1    2     0    0    3     1
********************************************************************************
```

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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #31 Center Street / Oxford Street
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.674
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        13.3
Optimal Cycle:       46               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    19   19    19    19   19    19    19   19    19    19   19    19
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      50  663    42    11 1145    39    26   10    43    19    6     8
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   50  663    42    11 1145    39    26   10    43    19    6     8
Added Vol:      0   77    -2    -5  214     0     4   -4     0     0    0     0
Future:        30   90    10     0   70    30    60    0    30     0    0     0
Initial Fut:   80  830    50     6 1429    69    90    6    73    19    6     8
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    80  830    50     6 1429    69    90    6    73    19    6     8
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   80  830    50     6 1429    69    90    6    73    19    6     8
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    80  830    50     6 1429    69    90    6    73    19    6     8
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.11 0.85  0.85  0.28 0.85  0.85  0.70 0.70  0.70  0.74 0.74  0.74
Lanes:       1.00 1.89  0.11  1.00 1.91  0.09  0.53 0.04  0.43  0.58 0.18  0.24
Final Sat.:   210 3037   183   525 3078   149   709   47   575   804  254   339
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.38 0.27  0.27  0.01 0.46  0.46  0.13 0.13  0.13  0.02 0.02  0.02
Crit Moves:                        ****             ****
Green/Cycle: 0.58 0.58  0.58  0.58 0.58  0.58  0.29 0.29  0.29  0.29 0.29  0.29
Volume/Cap:  0.65 0.47  0.47  0.02 0.79  0.79  0.43 0.43  0.43  0.08 0.08  0.08
Delay/Veh:   32.7  8.6   8.6   5.8 14.0  14.0  22.2 22.2  22.2  17.1 17.1  17.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  32.7  8.6   8.6   5.8 14.0  14.0  22.2 22.2  22.2  17.1 17.1  17.1
DesignQueue:    1   13     1     0   24     1     2    0     2     0    0     0
********************************************************************************
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```
--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #32 Stadium Rim Road / Gayley Road
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        1.286
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):        95.5
Optimal Cycle:        0               Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0  386    19   128  471     0    12    5    14    18    1   118
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  386    19   128  471     0    12    5    14    18    1   118
Added Vol:      0   74    30    34   65     0     0    0     0    25    0     8
Future:         0   66    11    22  110     0     0    0     0    11    0    22
Initial Fut:    0  526    60   184  646     0    12    5    14    54    1   148
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  526    60   184  646     0    12    5    14    54    1   148
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  526    60   184  646     0    12    5    14    54    1   148
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  526    60   184  646     0    12    5    14    54    1   148
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 0.90  0.10  0.22 0.78  0.00  0.39 0.16  0.45  0.26 0.01  0.73
Final Sat.:     0  580    66   143  502     0   179   75   209   144    3   395
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.91  0.91  1.29 1.29  xxxx  0.07 0.07  0.07  0.37 0.37  0.37
Crit Moves:             ****  ****             ****                   ****
Delay/Veh:    0.0 39.3  39.3 158.4  158   0.0  10.8 10.8  10.8  13.2 13.2  13.2
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 39.3  39.3 158.4  158   0.0  10.8 10.8  10.8  13.2 13.2  13.2
LOS by Move:    *    E     E     F    F     *     B    B     B     B    B     B
ApproachDel:       39.3            158.4             10.8             13.2
Delay Adj:         1.00             1.00             1.00             1.00
ApprAdjDel:        39.3            158.4             10.8             13.2
LOS by Appr:         E                F                B                B
********************************************************************************
```

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------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #33 Allston Way / Oxford Street
********************************************************************************
Average Delay (sec/veh):      1.9          Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  1  0  0    0  1  0  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      17  798     0    59 1111    34    16     0    33     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   17  798     0    59 1111    34    16     0    33     0     0     0
Added Vol:      0   75     0     0  214     0     0     0     0     0     0     0
Future:        10  130     0    10   80    10     0     0    30     0     0     0
Initial Fut:   27 1003     0    69 1405    44    16     0    63     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:    29 1078     0    74 1511    47    17     0    68     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Final Vol.:    29 1078     0    74 1511    47    17     0    68     0     0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1050 xxxx xxxxx  1078 xxxx xxxxx  2042 xxxx    10  xxxx xxxx xxxxx
Potent Cap.:  503 xxxx xxxxx   654 xxxx xxxxx    37 xxxx   805  xxxx xxxx xxxxx
Move Cap.:    503 xxxx xxxxx   654 xxxx xxxxx    32 xxxx   805  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 12.6 xxxx xxxxx  11.2 xxxx xxxxx 204.1 xxxx   9.9 xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     F    *     A     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 12.6 xxxx xxxxx  11.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *     *     *
ApproachDel:     xxxxxx           xxxxxx             49.2           xxxxxx
ApproachLOS:        *                *                 E                *
```



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------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #34 Kittridge Street / Oxford Street / Fulton Street
********************************************************************************
Average Delay (sec/veh): OVERFLOW          Worst Case Level Of Service:       F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  1  0    0  1  0  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      13  801     0     0 1122    18     6     0    23     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   13  801     0     0 1122    18     6     0    23     0     0     0
Added Vol:      0   68    23    69  145     0     0    27     0     2     3     7
Future:         0  120     0     0   70    30    10     0    10     0     0     0
Initial Fut:   13  989    23    69 1337    48    16    27    33     2     3     7
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    13  989    23    69 1337    48    16    27    33     2     3     7
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Final Vol.:    13  989    23    69 1337    48    16    27    33     2     3     7
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.5  6.5   6.9   7.5  6.5   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  513 xxxx xxxxx  1012 xxxx xxxxx  1521 2303     0  1257 2322   506
Potent Cap.:  701 xxxx xxxxx   693 xxxx xxxxx    55   26     0    86   25   517
Move Cap.:    701 xxxx xxxxx   693 xxxx xxxxx    44   23     0     0   22   517
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 10.2 xxxx xxxxx  10.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     *    *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx   49 xxxxx  xxxx    0 xxxxx
Shrd StpDel: 10.2 xxxx xxxxx  10.8 xxxx xxxxx xxxxx  466 xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    F     *     *     *     *
ApproachDel:     xxxxxx           xxxxxx            466.0           xxxxxx
ApproachLOS:        *                *                 F                F
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #35 Stadium Rim Road / Centennial Drive
********************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.355
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       9.9
Optimal Cycle:        0              Level Of Service:                 A
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  0  0  0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0   70  160    94   22    0     0    0    0   114    0   71
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0   70  160    94   22    0     0    0    0   114    0   71
Added Vol:      0    0    0    64    0    0     0    0    0     0    0   33
Future:         0   22   22    22   11    0     0    0    0    22    0   11
Initial Fut:    0   92  182   180   33    0     0    0    0   136    0  115
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:     0   92  182   180   33    0     0    0    0   136    0  115
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0   92  182   180   33    0     0    0    0   136    0  115
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:     0   92  182   180   33    0     0    0    0   136    0  115
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.00 0.34 0.66  0.85 0.15 0.00  0.00 0.00 0.00  0.54 0.00 0.46
Final Sat.:     0  264  523   585  107    0     0    0    0   384    0  324
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.35 0.35  0.31 0.31 xxxx  xxxx xxxx xxxx  0.35 xxxx 0.35
Crit Moves:            ****       ****                       ****
Delay/Veh:    0.0  9.6  9.6  10.1 10.1  0.0   0.0  0.0  0.0  10.2  0.0 10.2
Delay Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   0.0  9.6  9.6  10.1 10.1  0.0   0.0  0.0  0.0  10.2  0.0 10.2
LOS by Move:    *    A    A     B    B    *     *    *    *     B    *    B
ApproachDel:        9.6            10.1           xxxxxx           10.2
Delay Adj:         1.00            1.00            xxxxx           1.00
ApprAdjDel:         9.6            10.1           xxxxxx           10.2
LOS by Appr:          A               B                *              B
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #36 Bancroft Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.621
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      10.7
Optimal Cycle:       42              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    18   18    0     0   18   18     0    0    0    16   16   16
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      29  912    0     0  788   12     1    0   62   116   51   71
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   29  912    0     0  788   12     1    0   62   116   51   71
Added Vol:      0  124    0     0   90    0     0    0    0    12    0    9
Future:        11  308    0     0  209   11     0    0    0    33   11   11
Initial Fut:   40 1344    0     0 1087   23     1    0   62   161   62   91
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    40 1344    0     0 1087   23     1    0   62   161   62   91
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   40 1344    0     0 1087   23     1    0   62   161   62   91
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:    40 1344    0     0 1087   23     1    0   62   161   62   91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.23 0.86 1.00  1.00 0.85 0.85  0.78 1.00 0.78  0.65 0.82 0.82
Lanes:       1.00 2.00 0.00  0.00 1.96 0.04  0.02 0.00 0.98  1.00 0.41 0.59
Final Sat.:   439 3249    0     0 3172   67    23    0 1453  1228  631  927
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.41 0.00  0.00 0.34 0.34  0.04 0.00 0.04  0.13 0.10 0.10
Crit Moves:       ****                                       ****
Green/Cycle: 0.63 0.63 0.00  0.00 0.63 0.63  0.25 0.00 0.25  0.25 0.25 0.25
Volume/Cap:  0.14 0.66 0.00  0.00 0.54 0.54  0.17 0.00 0.17  0.53 0.40 0.40
Delay/Veh:    6.0  9.2  0.0   0.0  7.8  7.8  20.3  0.0 20.3  27.8 23.6 23.6
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   6.0  9.2  0.0   0.0  7.8  7.8  20.3  0.0 20.3  27.8 23.6 23.6
DesignQueue:    1   20    0     0   16    0     0    0    2     4    2    3
********************************************************************************
```

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-------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
-------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #37 Bancroft Way / Fulton Street
*******************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.421
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       9.7
Optimal Cycle:       49              Level Of Service:                A
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Ignore
Min. Green:    17   17    0     0   17   17     0    0    0    24   24   24
Lanes:        0  1  1  0  0    0  0  2  1  0    0  0  0  0  0    0  1  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      13  146    0     0 1071   79     0    0    0    84  173  650
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   13  146    0     0 1071   79     0    0    0    84  173  650
Added Vol:     13    0    0     0  127   20     0    0    0     2   24   91
Future:        10   10    0     0   60   10     0    0    0    10   20  110
Initial Fut:   36  156    0     0 1258  109     0    0    0    96  217  851
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.00
PHF Volume:    36  156    0     0 1258  109     0    0    0    96  217    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   36  156    0     0 1258  109     0    0    0    96  217    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.00
Final Vol.:    36  156    0     0 1258  109     0    0    0    96  217    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.71 0.71 1.00  1.00 0.90 0.90  1.00 1.00 1.00  0.81 0.81 1.00
Lanes:       0.37 1.63 0.00  0.00 2.76 0.24  0.00 0.00 0.00  0.61 1.39 1.00
Final Sat.:   506 2194    0     0 4716  409     0    0    0   941 2127 1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.07 0.00  0.00 0.27 0.27  0.00 0.00 0.00  0.10 0.10 0.00
Crit Moves:                       ****                              ****
Green/Cycle: 0.51 0.51 0.00  0.00 0.51 0.51  0.00 0.00 0.00  0.37 0.37 0.00
Volume/Cap:  0.14 0.14 0.00  0.00 0.53 0.53  0.00 0.00 0.00  0.28 0.28 0.00
Delay/Veh:    6.6  6.6  0.0   0.0  8.9  8.9   0.0  0.0  0.0  15.0 15.0  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   6.6  6.6  0.0   0.0  8.9  8.9   0.0  0.0  0.0  15.0 15.0  0.0
DesignQueue:    1    3    0     0   24    2     0    0    0     2    5    0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
-------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #38 Bancroft Way / Ellsworth Street
*******************************************************************************
Average Delay (sec/veh):      6.4          Worst Case Level Of Service:      C
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        1  1  0  0  0    0  0  0  0  1    0  0  0  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     241   60    0     0    0   11     0    0    0     0  674   39
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  241   60    0     0    0   11     0    0    0     0  674   39
Added Vol:     96    0    0     0    0    0     0    0    0     0  128    0
Future:        10    0    0     0    0    0     0    0    0     0  130    0
Initial Fut:  347   60    0     0    0   11     0    0    0     0  932   39
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   347   60    0     0    0   11     0    0    0     0  932   39
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Final Vol.:   347   60    0     0    0   11     0    0    0     0  932   39
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  466  971 xxxxx  xxxx xxxx   486  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  510  255 xxxxx  xxxx xxxx   586  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    501  255 xxxxx  xxxx xxxx   586  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 16.0 xxxx xxxxx xxxxx xxxx  11.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    C    *     *     *    *     B     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:  401 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 25.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     D    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:      21.6             11.3           xxxxxx           xxxxxx
ApproachLOS:        C                B               *                *
```

```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #39 Bancroft Way / Dana Street
********************************************************************************
Average Delay (sec/veh):      0.0          Worst Case Level Of Service:       A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  1  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0     0    0     0     0    0     0   145  721     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0     0    0     0     0    0     0   145  721     0
Added Vol:      0    0     0     0    0     0     0    0     0     4  128     0
Future:         0    0     0     0    0     0     0    0     0    50  130     0
Initial Fut:    0    0     0     0    0     0     0    0     0   199  979     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0     0    0     0     0    0     0   199  979     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0     0    0     0     0    0     0   199  979     0
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        *                *                *                *
```



```
--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #40 Bancroft Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.328
Loss Time (sec):      8 (Y+R = 23 sec) Average Delay (sec/veh):       21.6
Optimal Cycle:       46               Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    15    0     0     0    0     0     0    0     0     0   23     0
Lanes:        2  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     427    0     0     0    0     0     0    0     0     0  460     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  427    0     0     0    0     0     0    0     0     0  460     0
Added Vol:     24    0     0     0    0     0     0    0     0     0  144     0
Future:       100    0     0     0    0     0     0    0     0     0   70     0
Initial Fut:  551    0     0     0    0     0     0    0     0     0  674     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   551    0     0     0    0     0     0    0     0     0  674     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  551    0     0     0    0     0     0    0     0     0  674     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   551    0     0     0    0     0     0    0     0     0  674     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.91  1.00
Lanes:       2.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 3.00  0.00
Final Sat.:  3502    0     0     0    0     0     0    0     0     0 5187     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.13  0.00
Crit Moves:  ****                                                    ****
Green/Cycle: 0.23 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.35  0.00
Volume/Cap:  0.68 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.37  0.00
Delay/Veh:   28.2  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 16.2   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  28.2  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 16.2   0.0
DesignQueue:   16    0     0     0    0     0     0    0     0     0   16     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #41 Bancroft Way / Bowditch Street
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.597
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):        14.1
Optimal Cycle:        0               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     191    0    0    0    0    0    0    0    0   99  494    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  191    0    0    0    0    0    0    0    0   99  494    0
Added Vol:      0    0    0    0    0    0    0    0    0    3  144    0
Future:        10    0    0    0    0    0    0    0    0   20   60    0
Initial Fut:  201    0    0    0    0    0    0    0    0  122  698    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   201    0    0    0    0    0    0    0    0  122  698    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  201    0    0    0    0    0    0    0    0  122  698    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   201    0    0    0    0    0    0    0    0  122  698    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.30 1.70 0.00
Final Sat.:   625    0    0    0    0    0    0    0    0  204 1189    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.32 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.60 0.59 xxxx
Crit Moves:  ****                                         ****
Delay/Veh:   11.1  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 15.2 14.7  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  11.1  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 15.2 14.7  0.0
LOS by Move:    B    *    *    *    *    *    *    *    *    C    B    *
ApproachDel:      11.1           xxxxxx           xxxxxx           14.8
Delay Adj:        1.00            xxxxx            xxxxx           1.00
ApprAdjDel:       11.1           xxxxxx           xxxxxx           14.8
LOS by Appr:        B                *                *               B
********************************************************************************
```



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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #42 Bancroft Way / College Avenue
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.747
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):        17.0
Optimal Cycle:        0               Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     343    0    0    0    0    0    0    0    0   34  203    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  343    0    0    0    0    0    0    0    0   34  203    0
Added Vol:    157    0    0    0    0    0    0    0    0    2  132    0
Future:        11    0    0    0    0    0    0    0    0   22   66    0
Initial Fut:  511    0    0    0    0    0    0    0    0   58  401    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   511    0    0    0    0    0    0    0    0   58  401    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  511    0    0    0    0    0    0    0    0   58  401    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   511    0    0    0    0    0    0    0    0   58  401    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.25 1.75 0.00
Final Sat.:   684    0    0    0    0    0    0    0    0  148 1039    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.75 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.39 0.39 xxxx
Crit Moves:  ****                                         ****
Delay/Veh:   21.4  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 12.2 12.1  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  21.4  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0 12.2 12.1  0.0
LOS by Move:    C    *    *    *    *    *    *    *    *    B    B    *
ApproachDel:      21.4           xxxxxx           xxxxxx           12.1
Delay Adj:        1.00            xxxxx            xxxxx           1.00
ApprAdjDel:       21.4           xxxxxx           xxxxxx           12.1
LOS by Appr:        C                *                *               B
********************************************************************************
```

```
Cum+UC Proj+25 Inc Var+LBNLWed May 12, 2004 10:50:26             Page 51-1
------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
******************************************************************************
Intersection #43 Bancroft Way / Piedmont Avenue
******************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        1.284
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):      102.6
Optimal Cycle:        0               Level Of Service:                  F
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:         Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     131  553    0     0  344  123     0    0    0     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  131  553    0     0  344  123     0    0    0     0    0    0
Added Vol:    104  141    0     0   47   30     0    0    0     0    0    0
Future:        11   66    0     0   44   66     0    0    0     0    0    0
Initial Fut:  246  760    0     0  435  219     0    0    0     0    0    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   246  760    0     0  435  219     0    0    0     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  246  760    0     0  435  219     0    0    0     0    0    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   246  760    0     0  435  219     0    0    0     0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.24 0.76 0.00  0.00 0.67 0.33  0.00 0.00 0.00  0.00 0.00 0.00
Final Sat.:   192  592    0     0  534  269     0    0    0     0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     1.28 1.28 xxxx  xxxx 0.82 0.82  xxxx xxxx xxxx  xxxx xxxx xxxx
Crit Moves:       ****            ****
Delay/Veh:  153.6  154  0.0   0.0 24.1 24.1   0.0  0.0  0.0   0.0  0.0  0.0
Delay Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh: 153.6  154  0.0   0.0 24.1 24.1   0.0  0.0  0.0   0.0  0.0  0.0
LOS by Move:   F    F    *     *    C    C     *    *    *     *    *    *
ApproachDel:     153.6             24.1            xxxxxx           xxxxxx
Delay Adj:        1.00             1.00             xxxxx            xxxxx
ApprAdjDel:      153.6             24.1            xxxxxx           xxxxxx
LOS by Appr:       F                 C                *                *
******************************************************************************
```



```
Cum+UC Proj+25 Inc Var+LBNLWed May 12, 2004 10:50:26             Page 52-1
------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #44 Durant Avenue / Shattuck Avenue
******************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.753
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       14.4
Optimal Cycle:       59               Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Permitted       Prot+Permit        Permitted        Permitted
Rights:         Include          Include          Include          Include
Min. Green:   19   19   19     5   19   19    17   17   17     0    0    0
Lanes:       1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      55  943  136    67  886    8     9   70   35     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   55  943  136    67  886    8     9   70   35     0    0    0
Added Vol:      0  124  106    66   36    0     0    0    0     0    0    0
Future:        10   90   70    40  180   10   200   40    0     0    0    0
Initial Fut:   65 1157  312   173 1102   18   209  110   35     0    0    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    65 1157  312   173 1102   18   209  110   35     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   65 1157  312   173 1102   18   209  110   35     0    0    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:    65 1157  312   173 1102   18   209  110   35     0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  1.00 0.95 0.95  1.00 0.95 0.95  0.95 0.95 0.95  1.00 1.00 1.00
Lanes:       1.00 1.58 0.42  1.00 1.97 0.03  1.00 0.76 0.24  0.00 0.00 0.00
Final Sat.:  1900 2843  767  1900 3552   58  1805 1369  436     0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.41 0.41  0.09 0.31 0.31  0.12 0.08 0.08  0.00 0.00 0.00
Crit Moves:       ****       ****            ****
Green/Cycle: 0.45 0.45 0.45  0.10 0.55 0.55  0.26 0.28 0.28  0.00 0.00 0.00
Volume/Cap:  0.08 0.90 0.90  0.90 0.56 0.56  0.44 0.29 0.29  0.00 0.00 0.00
Delay/Veh:    4.7 15.7 15.7  69.6  2.8  2.8  21.8 18.9 18.9   0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   4.7 15.7 15.7  69.6  2.8  2.8  21.8 18.9 18.9   0.0  0.0  0.0
DesignQueue:    1   25    7     6   19    0     6    3    1     0    0    0
******************************************************************************
```

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--------------------------------------------------------------------------------
                       365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                           AM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #45 Durant Avenue / Fulton Street
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.459
Loss Time (sec):      8 (Y+R =  3 sec) Average Delay (sec/veh):       10.9
Optimal Cycle:       51              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    21   21     0    22   22    22     0    0     0
Lanes:        0  0  0  0  0   1  1  1  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0   459  656     0   123  262    27     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   459  656     0   123  262    27     0    0     0
Added Vol:      0    0     0    96   34     0    13  159     0     0    0     0
Future:         0    0     0    30   40     0    20   90    30     0    0     0
Initial Fut:    0    0     0   585  730     0   156  511    57     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0   585  730     0   156  511    57     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0   585  730     0   156  511    57     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0    0     0   585  730     0   156  511    57     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.95 0.95  1.00  0.99 0.94  0.94  1.00 1.00  1.00
Lanes:       0.00 0.00  0.00  1.33 1.67  0.00  1.00 1.80  0.20  0.00 0.00  0.00
Final Sat.:     0    0     0  2409 3006     0  1872 3199   357     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.24 0.24  0.00  0.08 0.16  0.16  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.00 0.00  0.00  0.53 0.53  0.00  0.35 0.35  0.35  0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.00  0.46 0.46  0.00  0.24 0.46  0.46  0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0   7.4  7.4   0.0  15.9 17.7  17.7   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0   7.4  7.4   0.0  15.9 17.7  17.7   0.0  0.0   0.0
DesignQueue:    0    0     0    11   13     0     4   13     1     0    0     0
********************************************************************************
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--------------------------------------------------------------------------------
                       365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                           AM Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #46 Durant Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.371
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       12.0
Optimal Cycle:       43              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   18    18     0    0     0    17   17     0     0    0     0
Lanes:        0  0  1  1  0   0  0  0  0  0   0  1  2  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0  362    86     0    0     0    73  387     0     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  362    86     0    0     0    73  387     0     0    0     0
Added Vol:      0    7    24     0    0     0    17  142     0     0    0     0
Future:         0  110    40     0    0     0     0  130     0     0    0     0
Initial Fut:    0  479   150     0    0     0    90  659     0     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  479   150     0    0     0    90  659     0     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  479   150     0    0     0    90  659     0     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  479   150     0    0     0    90  659     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.92  0.92  1.00 1.00  1.00  0.91 0.91  1.00  1.00 1.00  1.00
Lanes:       0.00 1.52  0.48  0.00 0.00  0.00  0.36 2.64  0.00  0.00 0.00  0.00
Final Sat.:     0 2650   830     0    0     0   623 4564     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.18  0.00 0.00  0.00  0.14 0.14  0.00  0.00 0.00  0.00
Crit Moves:       ****                                ****
Green/Cycle: 0.00 0.49  0.49  0.00 0.00  0.00  0.39 0.39  0.00  0.00 0.00  0.00
Volume/Cap:  0.00 0.37  0.37  0.00 0.00  0.00  0.37 0.37  0.00  0.00 0.00  0.00
Delay/Veh:    0.0  8.8   8.8   0.0  0.0   0.0  14.7 14.7   0.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  8.8   8.8   0.0  0.0   0.0  14.7 14.7   0.0   0.0  0.0   0.0
DesignQueue:    0    9     3     0    0     0     2   15     0     0    0     0
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #47 Durant Avenue / College Avenue
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.466
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        13.9
Optimal Cycle:       42               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0   18    18    0    0     0   16   16    16    0    0     0
Lanes:       0  0  0  1  0   0  1  0  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  213    66   13   23     0   64  228    87    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  213    66   13   23     0   64  228    87    0    0     0
Added Vol:     0   29    52    0    2     0  128   42     2    0    0     0
Future:        0   11    99    0   22     0   22   99    44    0    0     0
Initial Fut:   0  253   217   13   47     0  214  369   133    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  253   217   13   47     0  214  369   133    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  253   217   13   47     0  214  369   133    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  253   217   13   47     0  214  369   133    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.94  0.94 0.92 0.92  1.00 0.96 0.91  0.91 1.00 1.00  1.00
Lanes:       0.00 0.54  0.46 0.22 0.78  0.00 1.00 1.47  0.53 0.00 0.00  0.00
Final Sat.:    0  959   823  377 1362     0 1824 2547   918    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.26  0.26 0.03 0.03  0.00 0.12 0.14  0.14 0.00 0.00  0.00
Crit Moves:       ****                             ****
Green/Cycle: 0.00 0.57  0.57 0.57 0.57  0.00 0.31 0.31  0.31 0.00 0.00  0.00
Volume/Cap:  0.00 0.47  0.47 0.06 0.06  0.00 0.38 0.47  0.47 0.00 0.00  0.00
Delay/Veh:    0.0  7.0   7.0  6.5  6.5   0.0 19.0 19.1  19.1  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  7.0   7.0  6.5  6.5   0.0 19.0 19.1  19.1  0.0  0.0   0.0
DesignQueue:   0    4     4    0    1     0    5   10     3    0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
               2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #48 Durant Avenue / Piedmont Avenue
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        1.150
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):        59.7
Optimal Cycle:        0               Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1  0  0   0  0  1  0  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  489     0    0  345     0  158    0    86    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  489     0    0  345     0  158    0    86    0    0     0
Added Vol:     0  160     0    0   47     0   85    0     9    0    0     0
Future:        0   50     0    0   40     0   30    0    60    0    0     0
Initial Fut:   0  699     0    0  432     0  273    0   155    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  699     0    0  432     0  273    0   155    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  699     0    0  432     0  273    0   155    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  699     0    0  432     0  273    0   155    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 1.00  0.00 0.00 1.00  0.00 1.00 0.00  1.00 0.00 0.00  0.00
Final Sat.:    0  608     0    0  579     0  471    0   557    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 1.15  xxxx xxxx 0.75  xxxx 0.58 xxxx  0.28 xxxx xxxx  xxxx
Crit Moves:       ****             ****        ****
Delay/Veh:    0.0  107   0.0  0.0 24.8   0.0 20.0  0.0  11.5  0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  107   0.0  0.0 24.8   0.0 20.0  0.0  11.5  0.0  0.0   0.0
LOS by Move:   *    F     *    *    C     *    C    *     B    *    *     *
ApproachDel:      107.5             24.8             16.9           xxxxxx
Delay Adj:         1.00             1.00             1.00            xxxxx
ApprAdjDel:       107.5             24.8             16.9           xxxxxx
LOS by Appr:        F                C                C                *
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #49 Channing Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.655
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        7.3
Optimal Cycle:       46               Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16    16   16   16    16   22   22    22   22   22    22
Lanes:        1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      42 1070    96   19  868    19   12   59    42   62   28    39
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   42 1070    96   19  868    19   12   59    42   62   28    39
Added Vol:      0  227    44    0   36     0    0    0     0    3    0     3
Future:        20  130    20   40   90    70   30   40    20   30   10    10
Initial Fut:   62 1427   160   59  994    89   42   99    62   95   38    52
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    62 1427   160   59  994    89   42   99    62   95   38    52
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   62 1427   160   59  994    89   42   99    62   95   38    52
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    62 1427   160   59  994    89   42   99    62   95   38    52
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.26 0.94  0.94 0.12 0.94  0.94 0.88 0.88  0.88 0.76 0.76  0.76
Lanes:       1.00 1.80  0.20 1.00 1.84  0.16 0.21 0.49  0.30 0.51 0.21  0.28
Final Sat.:   494 3197   358  219 3274   293  345  812   509  741  296   405
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.45  0.45 0.27 0.30  0.30 0.12 0.12  0.12 0.13 0.13  0.13
Crit Moves:       ****                                             ****
Green/Cycle: 0.54 0.54  0.54 0.54 0.54  0.54 0.34 0.34  0.34 0.34 0.34  0.34
Volume/Cap:  0.23 0.83  0.83 0.50 0.56  0.56 0.36 0.36  0.36 0.38 0.38  0.38
Delay/Veh:    3.8  7.1   7.1 16.6  3.4   3.4 18.0 18.0  18.0 18.5 18.5  18.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   3.8  7.1   7.1 16.6  3.4   3.4 18.0 18.0  18.0 18.5 18.5  18.5
DesignQueue:    1   27     3    1   18     2    1    2     2    2    1     1
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #50 Channing Way / Fulton Street
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.604
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       14.7
Optimal Cycle:        0               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  0  0   0  1  0  1  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0   86  543    51    0  132    20    7   72     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0   86  543    51    0  132    20    7   72     0
Added Vol:      0    0     0   32    2     0    0   44     0    0    6     0
Future:         0    0     0    0   30     0    0   90     0   10   40     0
Initial Fut:    0    0     0  118  575    51    0  266    20   17  118     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0  118  575    51    0  266    20   17  118     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  118  575    51    0  266    20   17  118     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0    0     0  118  575    51    0  266    20   17  118     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 0.32 1.54  0.14 0.00 0.93  0.07 0.13 0.87  0.00
Final Sat.:     0    0     0  195  975    88    0  579    44   73  509     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx 0.60 0.59  0.58 xxxx 0.46  0.46 0.23 0.23  xxxx
Crit Moves:                  ****                  ****        ****
Delay/Veh:    0.0  0.0   0.0 16.7 15.9  15.3  0.0 13.1  13.1 10.6 10.6   0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 16.7 15.9  15.3  0.0 13.1  13.1 10.6 10.6   0.0
LOS by Move:    *    *     *    C    C     C    *    B     B    B    B     *
ApproachDel:     xxxxxx           16.0             13.1             10.6
Delay Adj:        xxxxx           1.00             1.00             1.00
ApprAdjDel:      xxxxxx           16.0             13.1             10.6
LOS by Appr:        *               C                B                B
********************************************************************************
```

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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #51 Channing Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.491
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      11.9
Optimal Cycle:       43              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18    0    0     0   17   17     0    0   17    17
Lanes:       0  1  0  1  0    0  0  0  0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00-9:00 AM (WB thru adjusted due
Base Vol:     56  423    79    0    0     0   16  179     0    0   98     9
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  56  423    79    0    0     0   16  179     0    0   98     9
Added Vol:     0   30    68    0    0     0    0   76     0    0    6     0
Future:       10   40    30    0    0     0   60   30     0    0   30    50
Initial Fut:  66  493   177    0    0     0   76  285     0    0  134    59
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   66  493   177    0    0     0   76  285     0    0  134    59
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  66  493   177    0    0     0   76  285     0    0  134    59
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   66  493   177    0    0     0   76  285     0    0  134    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.88 0.88  0.88 1.00 1.00  1.00 0.90 0.90  1.00 1.00 0.96  0.96
Lanes:      0.18 1.34  0.48 0.00 0.00  0.00 0.21 0.79  0.00 0.00 0.69  0.31
Final Sat.:  301 2247   807    0    0     0  360 1349     0    0 1265   557
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.22 0.22  0.22 0.00 0.00  0.00 0.21 0.21  0.00 0.00 0.11  0.11
Crit Moves:      ****                            ****
Green/Cycle: 0.45 0.45  0.45 0.00 0.00  0.00 0.43 0.43  0.00 0.00 0.43  0.43
Volume/Cap:  0.49 0.49  0.49 0.00 0.00  0.00 0.49 0.49  0.00 0.00 0.25  0.25
Delay/Veh:   11.0 11.0  11.0  0.0  0.0   0.0 13.9 13.9   0.0  0.0 12.0  12.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  11.0 11.0  11.0  0.0  0.0   0.0 13.9 13.9   0.0  0.0 12.0  12.0
DesignQueue:    1   10     4    0    0     0    2    6     0    0    3     1
********************************************************************************
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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #52 Channing Way / College Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.626
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      21.3
Optimal Cycle:       43              Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18   18   18    18    0    0     0   17   17    17
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM (WB thru, NB righ
Base Vol:     26  256    22    6   92     2   21   76    31   88  150    43
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  26  256    22    6   92     2   21   76    31   88  150    43
Added Vol:    25   81    -4    0    4     0    0    9     2    0   77     0
Future:       20   50    20    0   60    10   10   40    30   70   40    30
Initial Fut:  71  387    38    6  156    12   31  125    63  158  267    73
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   71  387    38    6  156    12   31  125    63  158  267    73
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  71  387    38    6  156    12   31  125    63  158  267    73
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   71  387    38    6  156    12   31  125    63  158  267    73
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.93 0.93  0.93 0.99 0.99  0.99 0.96 0.96  0.96 0.98 0.98  0.98
Lanes:      0.14 0.78  0.08 0.03 0.90  0.07 0.14 0.57  0.29 0.32 0.53  0.15
Final Sat.:  252 1374   135   65 1688   130  258 1042   525  591  998   273
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.28 0.28  0.28 0.09 0.09  0.09 0.12 0.12  0.12 0.27 0.27  0.27
Crit Moves:      ****                                              ****
Green/Cycle: 0.58 0.58  0.58 0.58 0.58  0.58 0.30 0.30  0.30 0.30 0.30  0.30
Volume/Cap:  0.49 0.49  0.49 0.16 0.16  0.16 0.40 0.40  0.40 0.90 0.90  0.90
Delay/Veh:    6.6  6.6   6.6  4.2  4.2   4.2 20.5 20.5  20.5 42.2 42.2  42.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   6.6  6.6   6.6  4.2  4.2   4.2 20.5 20.5  20.5 42.2 42.2  42.2
DesignQueue:    1    6     1    0    2     0    1    3     2    4    7     2
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                   AM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #53 Haste Street / Shattuck Avenue
********************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.712
Loss Time (sec):      8 (Y+R =  6 sec) Average Delay (sec/veh):        46.0
Optimal Cycle:       47               Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   21   21     0    0   21    21    0    0     0   18   18    18
Lanes:       1  0  2  0  0   0  0  1  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     66 1117     0    0  903    46    0    0     0  185  276    75
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  66 1117     0    0  903    46    0    0     0  185  276    75
Added Vol:     0  271     0    0   33     5    0    0     0    4    8     0
Future:       10  130     0    0  110    20    0    0     0   30  110    20
Initial Fut:  76 1518     0    0 1046    71    0    0     0  219  394    95
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   76 1518     0    0 1046    71    0    0     0  219  394    95
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  76 1518     0    0 1046    71    0    0     0  219  394    95
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   76 1518     0    0 1046    71    0    0     0  219  394    95
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.17 0.95  1.00 1.00 0.94  0.94 1.00 1.00  1.00 0.91 0.91  0.91
Lanes:       1.00 2.00  0.00 0.00 1.87  0.13 0.00 0.00  0.00 0.62 1.11  0.27
Final Sat.:   315 3610     0    0 3347   227    0    0     0 1072 1929   465
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.42  0.00 0.00 0.31  0.31 0.00 0.00  0.00 0.20 0.20  0.20
Crit Moves:       ****                                           ****
Green/Cycle: 0.37 0.37  0.00 0.00 0.37  0.37 0.00 0.00  0.00 0.51 0.51  0.51
Volume/Cap:  0.65 1.14  0.00 0.00 0.84  0.84 0.00 0.00  0.00 0.40 0.40  0.40
Delay/Veh:   35.2 83.6   0.0  0.0 18.2  18.2  0.0  0.0   0.0 10.6 10.6  10.6
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  35.2 83.6   0.0  0.0 18.2  18.2  0.0  0.0   0.0 10.6 10.6  10.6
DesignQueue:    2   39     0    0   26     2    0    0     0    4    7     2
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                   AM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #54 Haste Street / Fulton Street
********************************************************************************
Cycle (sec):         80               Critical Vol./Cap. (X):        0.379
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        15.2
Optimal Cycle:       53               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0   25    25    0    0     0   20   20     0
Lanes:       0  0  0  0  0   0  0  1  1  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0     0    0  433   145    0    0     0   23  380     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0    0  433   145    0    0     0   23  380     0
Added Vol:     0    0     0    0    1     1    0    0     0    0   12     0
Future:        0    0     0    0   50    20    0    0     0    0  140     0
Initial Fut:   0    0     0    0  484   166    0    0     0   23  532     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0     0    0  484   166    0    0     0   23  532     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0    0  484   166    0    0     0   23  532     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0    0  484   166    0    0     0   23  532     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 1.00 0.91  0.91 1.00 1.00  1.00 0.95 0.95  1.00
Lanes:       0.00 0.00  0.00 0.00 1.49  0.51 0.00 0.00  0.00 0.08 1.92  0.00
Final Sat.:     0    0     0    0 2586   887    0    0     0  150 3460     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.00 0.19  0.19 0.00 0.00  0.00 0.15 0.15  0.00
Crit Moves:                        ****                              ****
Green/Cycle: 0.00 0.00  0.00 0.00 0.49  0.49 0.00 0.00  0.00 0.41 0.41  0.00
Volume/Cap:  0.00 0.00  0.00 0.00 0.38  0.38 0.00 0.00  0.00 0.38 0.38  0.00
Delay/Veh:    0.0  0.0   0.0  0.0 13.2  13.2  0.0  0.0   0.0 17.4 17.4   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  0.0 13.2  13.2  0.0  0.0   0.0 17.4 17.4   0.0
DesignQueue:    0    0     0    0   11     4    0    0     0    1   15     0
********************************************************************************
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-------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #55 Haste Street / Telegraph Avenue
*******************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):         0.447
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       16.9
Optimal Cycle:        40              Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16     0     0    0     0     0    0     0     0   16    16
Lanes:        0  1  1  0  0   0  0  0  0  0   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     216  520     0     0    0     0     0    0     0     0  334    34
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  216  520     0     0    0     0     0    0     0     0  334    34
Added Vol:      0   98     0     0    0     0     0    0     0     0   12     0
Future:        20   50     0     0    0     0     0    0     0     0   90    30
Initial Fut:  236  668     0     0    0     0     0    0     0     0  436    64
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   236  668     0     0    0     0     0    0     0     0  436    64
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  236  668     0     0    0     0     0    0     0     0  436    64
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   236  668     0     0    0     0     0    0     0     0  436    64
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.93  0.93
Lanes:       0.52 1.48  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 1.74  0.26
Final Sat.:   942 2668     0     0    0     0     0    0     0     0 3088   453
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.25 0.25  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.14  0.14
Crit Moves:       ****                                               ****
Green/Cycle: 0.34 0.34  0.34  0.00 0.00  0.00  0.00 0.00  0.00  0.53 0.53  0.53
Volume/Cap:  0.73 0.73  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.26  0.26
Delay/Veh:   21.6 21.6   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  8.6   8.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  21.6 21.6   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0  8.6   8.6
DesignQueue:    6   17     0     0    0     0     0    0     0     0    8     1
*******************************************************************************
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-------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #56 Haste Street / College Avenue
*******************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):         0.630
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       11.3
Optimal Cycle:        40              Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16     0     0   16    16     0    0     0    16   16    16
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     167  267     0     0  115    69     0    0     0    48  223    21
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  167  267     0     0  115    69     0    0     0    48  223    21
Added Vol:     19  102     0     0    6     0     0    0     0     0   12     0
Future:        30   40     0     0   90    60     0    0     0    30   30    40
Initial Fut:  216  409     0     0  211   129     0    0     0    78  265    61
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   216  409     0     0  211   129     0    0     0    78  265    61
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  216  409     0     0  211   129     0    0     0    78  265    61
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   216  409     0     0  211   129     0    0     0    78  265    61
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.76 0.76  1.00  1.00 0.95  0.95  1.00 1.00  1.00  0.91 0.91  0.91
Lanes:       0.35 0.65  0.00  0.00 0.62  0.38  0.00 0.00  0.00  0.39 1.31  0.30
Final Sat.:   496  940     0     0 1119   684     0    0     0   665 2260   520
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.44 0.44  0.00  0.00 0.19  0.19  0.00 0.00  0.00  0.12 0.12  0.12
Crit Moves:       ****                                               ****
Green/Cycle: 0.63 0.63  0.00  0.00 0.63  0.63  0.00 0.00  0.00  0.25 0.25  0.25
Volume/Cap:  0.69 0.69  0.00  0.00 0.30  0.30  0.00 0.00  0.00  0.48 0.48  0.48
Delay/Veh:    8.2  8.2   0.0   0.0  3.4   3.4   0.0  0.0   0.0  22.8 22.8  22.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   8.2  8.2   0.0   0.0  3.4   3.4   0.0  0.0   0.0  22.8 22.8  22.8
DesignQueue:    3    6     0     0    3     2     0    0     0     2    7     2
*******************************************************************************
```

```
-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #57 Dwight Way / Martin Luther King Way
*******************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.877
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       22.3
Optimal Cycle:       83               Level Of Service:                  C
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    21   21    21     0    0     0
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:      62  690    66    88  868   163    68  419    83     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   62  690    66    88  868   163    68  419    83     0    0     0
Added Vol:      3    9     0     0   15    10     0  117    19     0    0     0
Future:        20   30    10    10  200    50    10   50    10     0    0     0
Initial Fut:   85  729    76    98 1083   223    78  586   112     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    85  729    76    98 1083   223    78  586   112     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   85  729    76    98 1083   223    78  586   112     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    85  729    76    98 1083   223    78  586   112     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.60 0.60  0.60  0.74 0.74  0.74  0.91 0.91  0.91  1.00 1.00  1.00
Lanes:       0.19 1.64  0.17  0.14 1.54  0.32  0.20 1.51  0.29  0.00 0.00  0.00
Final Sat.:   218 1874   195   195 2158   444   347 2607   498     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.39 0.39  0.39  0.50 0.50  0.50  0.22 0.22  0.22  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.53 0.53  0.53  0.53 0.53  0.53  0.30 0.30  0.30  0.00 0.00  0.00
Volume/Cap:  0.74 0.74  0.74  0.95 0.95  0.95  0.75 0.75  0.75  0.00 0.00  0.00
Delay/Veh:   13.2 13.2  13.2  25.4 25.4  25.4  27.1 27.1  27.1   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  13.2 13.2  13.2  25.4 25.4  25.4  27.1 27.1  27.1   0.0  0.0   0.0
DesignQueue:    2   14     1     2   22     5     2   17     3     0    0     0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #58 Dwight Way / Shattuck Avenue
*******************************************************************************
Cycle (sec):         65               Critical Vol./Cap. (X):        0.924
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       17.0
Optimal Cycle:       92               Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted       Prot+Permit       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  1  1  0    1  0  1  1  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0 1094   113    95  989     0    66  420   151     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1094   113    95  989     0    66  420   151     0    0     0
Added Vol:      0  231     0     3   34     0    39   77     0     0    0     0
Future:         0  130    30    10  110     0    20   50    10     0    0     0
Initial Fut:    0 1455   143   108 1133     0   125  547   161     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1455   143   108 1133     0   125  547   161     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1455   143   108 1133     0   125  547   161     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1455   143   108 1133     0   125  547   161     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  0.22 0.95  0.95  0.90 0.90  0.90  1.00 1.00  1.00
Lanes:       0.00 1.82  0.18  1.00 2.00  0.00  0.30 1.31  0.39  0.00 0.00  0.00
Final Sat.:     0 3244   319   425 3610     0   511 2235   658     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.45  0.45  0.25 0.31  0.00  0.24 0.24  0.24  0.00 0.00  0.00
Crit Moves:       ****        ****                   ****
Green/Cycle: 0.00 0.49  0.49  0.55 0.55  0.00  0.27 0.27  0.27  0.00 0.00  0.00
Volume/Cap:  0.00 0.92  0.92  0.46 0.57  0.00  0.92 0.92  0.92  0.00 0.00  0.00
Delay/Veh:    0.0 15.6  15.6  10.6  3.0   0.0  39.6 39.6  39.6   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 15.6  15.6  10.6  3.0   0.0  39.6 39.6  39.6   0.0  0.0   0.0
DesignQueue:    0   30     3     4   20     0     4   15     5     0    0     0
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #59 Dwight Way / Fulton Street
********************************************************************************
Cycle (sec):        70               Critical Vol./Cap. (X):        0.494
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):       13.6
Optimal Cycle:      45               Level Of Service:                 B
********************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    21    21    0     0     0   16    16     0    0     0
Lanes:       0  0  0  0  1   2  0  0  0  0   0  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0    0    12   449    0     0     0  620     6     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0    12   449    0     0     0  620     6     0    0     0
Added Vol:     0    0     0     1    0     0     0   80     0     0    0     0
Future:        0    0    10    30    0     0     0   70    30     0    0     0
Initial Fut:   0    0    22   480    0     0     0  770    36     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0    22   480    0     0     0  770    36     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0    0    22   480    0     0     0  770    36     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0    0    22   480    0     0     0  770    36     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  0.87  0.59 1.00  1.00  1.00 0.94  0.94  1.00 1.00  1.00
Lanes:       0.00 0.00  1.00  2.00 0.00  0.00  0.00 1.91  0.09  0.00 0.00  0.00
Final Sat.:    0    0  1644  2260    0     0     0 3425   160     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.01  0.21 0.00  0.00  0.00 0.22  0.22  0.00 0.00  0.00
Crit Moves:                   ****                  ****
Green/Cycle: 0.00 0.00  0.43  0.43 0.00  0.00  0.00 0.46  0.46  0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.03  0.49 0.00  0.00  0.00 0.49  0.49  0.00 0.00  0.00
Delay/Veh:    0.0  0.0  11.6  16.2  0.0   0.0   0.0 12.2  12.2   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0  11.6  16.2  0.0   0.0   0.0 12.2  12.2   0.0  0.0   0.0
DesignQueue:   0    0     0    11    0     0     0   17     1     0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #60 Dwight Way / Telegraph Avenue
********************************************************************************
Cycle (sec):        65               Critical Vol./Cap. (X):        0.763
Loss Time (sec):     8 (Y+R =  4 sec) Average Delay (sec/veh):       18.3
Optimal Cycle:      52               Level Of Service:                 B
********************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   15    15     0    0     0    17   17    17     0    0     0
Lanes:       0  0  1  1  0   0  0  0  0  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      0  697    78     0    0     0    66  479   565     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  697    78     0    0     0    66  479   565     0    0     0
Added Vol:     0   30     0     0    0     0    68   13     3     0    0     0
Future:        0   66    11     0    0     0    11   66    44     0    0     0
Initial Fut:   0  793    89     0    0     0   145  558   612     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  793    89     0    0     0   145  558   612     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  793    89     0    0     0   145  558   612     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0  793    89     0    0     0   145  558   612     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  1.00 1.00  1.00  0.82 0.82  0.82  1.00 1.00  1.00
Lanes:       0.00 1.80  0.20  0.00 0.00  0.00  0.22 0.85  0.93  0.00 0.00  0.00
Final Sat.:    0 3197   359     0    0     0   344 1325  1453     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.25  0.00 0.00  0.00  0.42 0.42  0.42  0.00 0.00  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.00 0.33  0.33  0.00 0.00  0.00  0.55 0.55  0.55  0.00 0.00  0.00
Volume/Cap:  0.00 0.76  0.76  0.00 0.00  0.00  0.76 0.76  0.76  0.00 0.00  0.00
Delay/Veh:    0.0 23.8  23.8   0.0  0.0   0.0  14.5 14.5  14.5   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 23.8  23.8   0.0  0.0   0.0  14.5 14.5  14.5   0.0  0.0   0.0
DesignQueue:   0   21     2     0    0     0     3   10    11     0    0     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #61 Dwight Way / College Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.570
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       12.5
Optimal Cycle:       39              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0   16    16    16   16     0    15   15    15     0    0     0
Lanes:       0  0  0  1  0    0  1  0  0  0    0  1  0  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  365    51    10  150     0    68  352    85     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  365    51    10  150     0    68  352    85     0    0     0
Added Vol:     0  113     0     0    6     0     7    5     0     0    0     0
Future:        0   50    10    20   90     0    20   20    10     0    0     0
Initial Fut:   0  528    61    30  246     0    95  377    95     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    0  550    64    31  256     0    99  393    99     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  550    64    31  256     0    99  393    99     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0  550    64    31  256     0    99  393    99     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.99  0.99  0.92 0.92  1.00  0.90 0.90  0.90  1.00 1.00  1.00
Lanes:       0.00 0.90  0.10  0.11 0.89  0.00  0.34 1.33  0.33  0.00 0.00  0.00
Final Sat.:    0 1679   194   190 1558     0   575 2282   575     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.33  0.33  0.16 0.16  0.00  0.17 0.17  0.17  0.00 0.00  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.00 0.57  0.57  0.57 0.57  0.00  0.30 0.30  0.30  0.00 0.00  0.00
Volume/Cap:  0.00 0.57  0.57  0.29 0.29  0.00  0.57 0.57  0.57  0.00 0.00  0.00
Delay/Veh:    0.0  7.7   7.7   5.2  5.2   0.0  21.1 21.1  21.1   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  7.7   7.7   5.2  5.2   0.0  21.1 21.1  21.1   0.0  0.0   0.0
DesignQueue:    0    9     1     0    4     0     3   10     3     0    0     0
********************************************************************************
```



```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #62 Dwight Way / Piedmont Avenue / Warring Street
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.471
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       10.9
Optimal Cycle:       61              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0   22     0    29   29     0    24   24    24    24    0    24
Lanes:       0  0  1  1  0    0  1  1  0  0    1  0  1  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: 7:00 AM - 9:00 AM
Base Vol:      0  583     0     8  324     0    91  143   238    42    0    48
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  583     0     8  324     0    91  143   238    42    0    48
Added Vol:     0  205     0     0   18     0     2    0     3     0    0     0
Future:        0   77    11    11   44     0    11   11    33    11    0    11
Initial Fut:   0  865    11    19  386     0   104  154   274    53    0    59
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  865    11    19  386     0   104  154   274    53    0    59
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  865    11    19  386     0   104  154   274    53    0    59
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0  865    11    19  386     0   104  154   274    53    0    59
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.95  0.86 0.86  1.00  0.71 1.00  0.85  0.77 1.00  0.77
Lanes:       0.00 1.97  0.03  0.09 1.91  0.00  1.00 1.00  1.00  0.47 0.00  0.53
Final Sat.:    0 3558    45   153 3117     0  1345 1900  1615   695    0   774
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.24  0.24  0.12 0.12  0.00  0.08 0.08  0.17  0.08 0.00  0.08
Crit Moves:       ****                                    ****
Green/Cycle: 0.00 0.51  0.51  0.51 0.51  0.00  0.37 0.37  0.37  0.37 0.00  0.37
Volume/Cap:  0.00 0.48  0.48  0.24 0.24  0.00  0.21 0.22  0.46  0.21 0.00  0.21
Delay/Veh:    0.0  8.8   8.8   7.1  7.1   0.0  15.0 14.8  18.1  14.9  0.0  14.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  8.8   8.8   7.1  7.1   0.0  15.0 14.8  18.1  14.9  0.0  14.9
DesignQueue:    0   16     0     0    7     0     2    4     6     1    0     1
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #63 Dwight Avenue / Prospect Street
********************************************************************************
Average Delay (sec/veh):      6.3          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0    14    0   109   246   72     0     0   53    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    14    0   109   246   72     0     0   53    15
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0    0     0     0    0    20    30    0     0     0   20     0
Initial Fut:    0    0     0    14    0   129   276   72     0     0   73    15
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    14    0   129   276   72     0     0   73    15
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0    14    0   129   276   72     0     0   73    15
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   705 xxxx    81    88 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   406 xxxx   985  1520 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   339 xxxx   985  1520 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  830 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 10.2 xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            10.2            xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #64 Adeline Street / Ward Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):        0.904
Loss Time (sec):       8 (Y+R =  6 sec) Average Delay (sec/veh):       20.6
Optimal Cycle:        83               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0   25    25     0   25    25    19    0    19     0    0     0
Lanes:        0  0  0  1  0    0  0  2  0  1    2  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0  784     3     0  736   546   723    0     4     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  784     3     0  736   546   723    0     4     0    0     0
Added Vol:      0  189     0     0   24     8    61    0     0     0    0     0
Future:         0   50     0     0   40    70   100    0     0     0    0     0
Initial Fut:    0 1023     3     0  800   624   884    0     4     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1023     3     0  800   624   884    0     4     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1023     3     0  800   624   884    0     4     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1023     3     0  800   624   884    0     4     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  1.00 0.95  0.85  0.92 1.00  0.85  1.00 1.00  1.00
Lanes:       0.00 0.99  0.01  0.00 2.00  1.00  2.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:     0 1894     6     0 3610  1615  3502    0  1615     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.54  0.54  0.00 0.22  0.39  0.25 0.00  0.00  0.00 0.00  0.00
Crit Moves:       ****                         ****
Green/Cycle: 0.00 0.58  0.58  0.00 0.58  0.58  0.29 0.00  0.29  0.00 0.00  0.00
Volume/Cap:  0.00 0.92  0.92  0.00 0.38  0.66  0.86 0.00  0.01  0.00 0.00  0.00
Delay/Veh:    0.0 26.1  26.1   0.0  7.7  12.8  31.4  0.0  16.4   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 26.1  26.1   0.0  7.7  12.8  31.4  0.0  16.4   0.0  0.0   0.0
DesignQueue:    0   18     0     0   13    10    24    0     0     0    0     0
********************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #65 Derby Street / Warring Street
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap. (X):         1.620
Loss Time (sec):       0 (Y+R =  4 sec) Average Delay (sec/veh):       243.2
Optimal Cycle:         0               Level Of Service:                   F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0    0     0  650    0    31   14   20     0    0   34   779
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0  650    0    31   14   20     0    0   34   779
Added Vol:      0    0     0   22    0     0    0    0     0    0    0   205
Future:         0    0     0   90    0    10    0   10     0    0    0    90
Initial Fut:    0    0     0  762    0    41   14   30     0    0   34  1074
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0  762    0    41   14   30     0    0   34  1074
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0  762    0    41   14   30     0    0   34  1074
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0    0     0  762    0    41   14   30     0    0   34  1074
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 0.95 0.00  0.05 0.32 0.68  0.00 0.00 0.03  0.97
Final Sat.:     0    0     0  574    0    31  166  355     0    0   21   663
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx 1.33 xxxx  1.33 0.08 0.08  xxxx  xxxx 1.62  1.62
Crit Moves:                  ****                 ****                 ****
Delay/Veh:    0.0  0.0   0.0 177.3  0.0 177.3 10.5 10.5   0.0   0.0  300 300.2
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 177.3  0.0 177.3 10.5 10.5   0.0   0.0  300 300.2
LOS by Move:    *    *     *    F    *     F    B    B     *     *    F     F
ApproachDel:    xxxxxx           177.3             10.5            300.2
Delay Adj:       xxxxx            1.00             1.00             1.00
ApprAdjDel:     xxxxxx           177.3             10.5            300.2
LOS by Appr:       *                F                B                F
********************************************************************************
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #66 Derby Street / Claremont Blvd.
********************************************************************************
Cycle (sec):          65               Critical Vol./Cap. (X):         0.744
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        31.8
Optimal Cycle:        61               Level Of Service:                   C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18    0    18    0    0     0    0   35    35   35   35     0
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       5    0    64    0    0     0    0  665    12   52  813     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    5    0    64    0    0     0    0  665    12   52  813     0
Added Vol:      0    0     0    0    0     0    0   22     0    0  205     0
Future:         0    0     0    0    0     0    0  100     0    0   90     0
Initial Fut:    5    0    64    0    0     0    0  787    12   52 1108     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     5    0    64    0    0     0    0  787    12   52 1108     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    5    0    64    0    0     0    0  787    12   52 1108     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     5    0    64    0    0     0    0  787    12   52 1108     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.87 1.00  0.87 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.07 0.00  0.93 0.00 0.00  0.00 0.00 0.98  0.02 0.04 0.96  0.00
Final Sat.:   120    0  1536    0    0     0    0 1868    28   85 1815     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.00  0.04 0.00 0.00  0.00 0.00 0.42  0.42 0.61 0.61  0.00
Crit Moves:  ****                                                ****
Green/Cycle: 0.28 0.00  0.28 0.00 0.00  0.00 0.00 0.60  0.60 0.60 0.60  0.00
Volume/Cap:  0.15 0.00  0.15 0.00 0.00  0.00 0.00 0.71  0.71 1.02 1.02  0.00
Delay/Veh:   18.3  0.0  18.3  0.0  0.0   0.0  0.0 12.8  12.8 45.7 45.7   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  18.3  0.0  18.3  0.0  0.0   0.0  0.0 12.8  12.8 45.7 45.7   0.0
DesignQueue:    0    0     2    0    0     0    0   13     0    1   19     0
********************************************************************************
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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #67 Ashby Avenue / Seventh Street
*******************************************************************************
Cycle (sec):         95              Critical Vol./Cap. (X):        0.977
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       54.0
Optimal Cycle:      156              Level Of Service:                 D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted      Split Phase      Split Phase
Rights:          Include          Include         Include          Include
Min. Green:    4   19    19     4   19    19     4   22    22     4   20    20
Lanes:       0  1  0  1  0    0  1  0  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:      62  162    54    54  193   224   433  915   306   111  663    25
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   62  162    54    54  193   224   433  915   306   111  663    25
Added Vol:      0    0     0     0    0     0     0   96     0     0   12     0
Future:       100   70    20    60   20    30    50   60    40    50   60    30
Initial Fut:  162  232    74   114  213   254   483 1071   346   161  735    55
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   162  232    74   114  213   254   483 1071   346   161  735    55
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  162  232    74   114  213   254   483 1071   346   161  735    55
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   162  232    74   114  213   254   483 1071   346   161  735    55
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.55 0.55  0.55  0.85 0.85  0.85  0.95 0.91  0.91  0.95 0.94  0.94
Lanes:       0.69 0.99  0.32  0.39 0.73  0.88  1.00 1.51  0.49  1.00 1.86  0.14
Final Sat.:   721 1032   329   632 1180  1408  1805 2628   849  1805 3325   249
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.22 0.22  0.22  0.18 0.18  0.18  0.27 0.41  0.41  0.09 0.22  0.22
Crit Moves:       ****                                    ****              ****
Green/Cycle: 0.26 0.26  0.26  0.26 0.26  0.26  0.40 0.40  0.40  0.22 0.21  0.21
Volume/Cap:  0.86 0.86  0.86  0.69 0.69  0.69  0.67 1.02  1.02  0.41 1.07  1.07
Delay/Veh:   47.1 47.1  47.1  34.3 34.3  34.3  23.6 54.5  54.5  34.2 94.3  94.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  47.1 47.1  47.1  34.3 34.3  34.3  23.6 54.5  54.5  34.2 94.3  94.3
DesignQueue:    7    9     3     5    9    10    16   38    12     7   33     2
*******************************************************************************
```



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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              AM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #68 Ashby Avenue / San Pablo Avenue
*******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.973
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       42.2
Optimal Cycle:      163              Level Of Service:                 D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    4   17    17     4   19    19    18   18    18    18   18    18
Lanes:       1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 7:00-9:00 AM
Base Vol:     173  521    53   137  741   128    84  584   134    51  613   135
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  173  521    53   137  741   128    84  584   134    51  613   135
Added Vol:      2   20    57     0   28     2     0   81    14    30    8     0
Future:        20  220    20    20  320    30    20  120    10    20   80    50
Initial Fut:  195  761   130   157 1089   160   104  785   158   101  701   185
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   195  761   130   157 1089   160   104  785   158   101  701   185
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  195  761   130   157 1089   160   104  785   158   101  701   185
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   195  761   130   157 1089   160   104  785   158   101  701   185
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.93  0.93  0.16 0.93  0.93  0.60 0.60  0.60
Lanes:       1.00 1.71  0.29  1.00 1.74  0.26  1.00 1.66  0.34  0.20 1.43  0.37
Final Sat.:  1805 3015   515  1805 3088   454   300 2930   590   233 1615   426
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.25  0.25  0.09 0.35  0.35  0.35 0.27  0.27  0.43 0.43  0.43
Crit Moves:  ****                   ****                              ****
Green/Cycle: 0.11 0.35  0.35  0.12 0.36  0.36  0.45 0.45  0.45  0.45 0.45  0.45
Volume/Cap:  0.97 0.72  0.72  0.72 0.97  0.97  0.78 0.60  0.60  0.97 0.97  0.97
Delay/Veh:   99.7 30.1  30.1  53.0 50.2  50.2  47.7 21.6  21.6  48.9 48.9  48.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  99.7 30.1  30.1  53.0 50.2  50.2  47.7 21.6  21.6  48.9 48.9  48.9
DesignQueue:   10   29     5     8   42     6     3   26     5     3   23     6
*******************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                         Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #69 Ashby Avenue / Adeline Street
********************************************************************************
Cycle (sec):        140               Critical Vol./Cap. (X):        0.624
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):       42.1
Optimal Cycle:       96               Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     4   38    38    6   38    38    4   22    22    4   32    32
Lanes:        1  0  1  1  0   1  0  2  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      74  567    61    11  438    96   189  564    49    83  549    14
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   74  567    61    11  438    96   189  564    49    83  549    14
Added Vol:      4   16     0     0    2     6    45   78     1     0   19     0
Future:        30   50    10    10   10    50    50  110    20    10  190     0
Initial Fut:  108  633    71    21  450   152   284  752    70    93  758    14
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   108  633    71    21  450   152   284  752    70    93  758    14
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  108  633    71    21  450   152   284  752    70    93  758    14
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   108  633    71    21  450   152   284  752    70    93  758    14
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.94  0.94  0.95 0.88  0.88  0.95 0.94  0.94  0.95 0.95  0.95
Lanes:       1.00 1.80  0.20  1.00 2.24  0.76  1.00 1.83  0.17  1.00 1.96  0.04
Final Sat.:  1805 3197   359  1805 3730  1260  1805 3260   303  1805 3534    65
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.20  0.20  0.01 0.12  0.12  0.16 0.23  0.23  0.05 0.21  0.21
Crit Moves:  ****                   ****       ****                   ****
Green/Cycle: 0.09 0.31  0.31  0.05 0.27  0.27  0.22 0.43  0.43  0.10 0.31  0.31
Volume/Cap:  0.70 0.64  0.64  0.24 0.44  0.44  0.70 0.53  0.53  0.53 0.70  0.70
Delay/Veh:   76.0 43.1  43.1  65.5 42.5  42.5  57.5 25.5  25.5  70.0 44.3  44.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  76.0 43.1  43.1  65.5 42.5  42.5  57.5 25.5  25.5  70.0 44.3  44.3
DesignQueue:    8   36     4     2   26     9    18   35     3     7   43     1
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                         Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #70 Ashby Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         80               Critical Vol./Cap. (X):        0.568
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):       16.8
Optimal Cycle:       53               Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    21   21    21    6   21    21   20   20    20   20   20    20
Lanes:        0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      77  590    26   124  450    35    33  557    31    40  550   182
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   77  590    26   124  450    35    33  557    31    40  550   182
Added Vol:      0  112     0     6   12     6    58   20     0     0   13    16
Future:        30   20    10    20   10    10    10  110    10    10  150    10
Initial Fut:  107  722    36   150  472    51   101  687    41    50  713   208
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   107  722    36   150  472    51   101  687    41    50  713   208
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  107  722    36   150  472    51   101  687    41    50  713   208
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   107  722    36   150  472    51   101  687    41    50  713   208
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.25 1.67  0.08  0.45 1.40  0.15  0.24 1.66  0.10  0.10 1.47  0.43
Final Sat.:   470 3172   158   847 2665   288   463 3149   188   196 2790   814
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.23 0.23  0.23  0.18 0.18  0.18  0.22 0.22  0.22  0.26 0.26  0.26
Crit Moves:       ****                                                ****
Green/Cycle: 0.40 0.40  0.40  0.40 0.40  0.40  0.45 0.45  0.45  0.45 0.45  0.45
Volume/Cap:  0.57 0.57  0.57  0.44 0.44  0.44  0.49 0.49  0.49  0.57 0.57  0.57
Delay/Veh:   20.2 20.2  20.2  18.4 18.4  18.4  14.0 14.0  14.0  15.0 15.0  15.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  20.2 20.2  20.2  18.4 18.4  18.4  14.0 14.0  14.0  15.0 15.0  15.0
DesignQueue:    3   20     1     4   13     1     3   18     1     1   19     5
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #71 Ashby Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):         80              Critical Vol./Cap. (X):        0.909
Loss Time (sec):     12 (Y+R =  6 sec) Average Delay (sec/veh):       26.9
Optimal Cycle:      100              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   21   21    21    0   21    21   25   25    25   25   25    25
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:     150  985    80  148  623   103   86  549   120   89  573    83
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  150  985    80  148  623   103   86  549   120   89  573    83
Added Vol:      3   29     0    0    3     0    0   25     0    0   26     2
Future:        50   40    10   10   60    30   20   90    20   10   80    10
Initial Fut:  203 1054    90  158  686   133  106  664   140   99  679    95
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   203 1054    90  158  686   133  106  664   140   99  679    95
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  203 1054    90  158  686   133  106  664   140   99  679    95
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   203 1054    90  158  686   133  106  664   140   99  679    95
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.26 0.94  0.94 0.27 0.93  0.93 0.21 0.93  0.93 0.19 0.93  0.93
Lanes:       1.00 1.84  0.16 1.00 1.68  0.32 1.00 1.65  0.35 1.00 1.75  0.25
Final Sat.:   494 3286   281  515 2951   572  393 2904   612  361 3110   435
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.41 0.32  0.32 0.31 0.23  0.23 0.27 0.23  0.23 0.27 0.22  0.22
Crit Moves:  ****            ****                             ****
Green/Cycle: 0.43 0.43  0.43 0.53 0.53  0.53 0.32 0.32  0.32 0.32 0.32  0.32
Volume/Cap:  0.96 0.75  0.75 0.58 0.44  0.44 0.83 0.71  0.71 0.85 0.67  0.67
Delay/Veh:   74.4 22.7  22.7 23.0 12.5  12.5 68.1 26.5  26.5 73.6 25.7  25.7
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  74.4 22.7  22.7 23.0 12.5  12.5 68.1 26.5  26.5 73.6 25.7  25.7
DesignQueue:    5   29     2    6   15     3    3   21     4    3   22     3
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #72 Ashby Avenue / College Avenue
********************************************************************************
Cycle (sec):         60              Critical Vol./Cap. (X):        1.196
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):       38.3
Optimal Cycle:      180              Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18   18   18    18   30   30    30   30   30    30
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      79  323    26  118  232    95   33  490    92    4  611   229
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   79  323    26  118  232    95   33  490    92    4  611   229
Added Vol:      0   29     0    4    3     0   18    7     0    0   28    66
Future:        20   20    10   20   20    60   20   80    10   10   20    30
Initial Fut:   99  372    36  142  255   155   71  577   102   14  659   325
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    99  372    36  142  255   155   71  577   102   14  659   325
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   99  372    36  142  255   155   71  577   102   14  659   325
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    99  372    36  142  255   155   71  577   102   14  659   325
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.81 0.81  0.81 0.73 0.73  0.73 0.84 0.84  0.84 0.94 0.94  0.94
Lanes:       0.20 0.73  0.07 0.26 0.46  0.28 0.09 0.77  0.14 0.01 0.66  0.33
Final Sat.:   301 1130   109  355  637   387  150 1222   216   25 1185   584
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.33 0.33  0.33 0.40 0.40  0.40 0.47 0.47  0.47 0.56 0.56  0.56
Crit Moves:                       ****                                 ****
Green/Cycle: 0.38 0.38  0.38 0.45 0.45  0.45 0.53 0.53  0.53 0.54 0.54  0.54
Volume/Cap:  0.88 0.88  0.88 0.89 0.89  0.89 0.90 0.90  0.90 1.04 1.04  1.04
Delay/Veh:   33.1 33.1  33.1 30.0 30.0  30.0 27.5 27.5  27.5 53.7 53.7  53.7
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  33.1 33.1  33.1 30.0 30.0  30.0 27.5 27.5  27.5 53.7 53.7  53.7
DesignQueue:    2    8     1    3    5     3    1   10     2    0   12     6
********************************************************************************
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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #73 Ashby Avenue / Claremont Avenue
********************************************************************************
Cycle (sec):         80              Critical Vol./Cap. (X):        0.850
Loss Time (sec):     12 (Y+R =  6 sec) Average Delay (sec/veh):       28.4
Optimal Cycle:       82              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Permitted         Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16    16   16    16    28   28    28    28   28    28
Lanes:       0  1  0  1  0    1  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:      35  288   153   321  272    59    43  504    13    90  637   429
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   35  288   153   321  272    59    43  504    13    90  637   429
Added Vol:      0    0     0    22    0     0     0   11     0     0   94   205
Future:        20   10    30    40   50    10    30   60    10    30   20    50
Initial Fut:   55  298   183   383  322    69    73  575    23   120  751   684
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    55  298   183   383  322    69    73  575    23   120  751   684
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   55  298   183   383  322    69    73  575    23   120  751   684
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    55  298   183   383  322    69    73  575    23   120  751   684
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
Lanes:       0.21 1.11  0.68  1.48 1.25  0.27  0.22 1.71  0.07  0.15 0.97  0.88
Final Sat.:   370 2007  1233  2680 2253   483   393 3094   124   279 1743  1588
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.15  0.15  0.14 0.14  0.14  0.19 0.19  0.19  0.43 0.43  0.43
Crit Moves:  ****              ****                                   ****
Green/Cycle: 0.20 0.20  0.20  0.20 0.20  0.20  0.45 0.45  0.45  0.45 0.45  0.45
Volume/Cap:  0.74 0.74  0.74  0.71 0.71  0.71  0.41 0.41  0.41  0.96 0.96  0.96
Delay/Veh:   34.2 34.2  34.2  32.2 32.2  32.2  12.6 12.6  12.6  31.3 31.3  31.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  34.2 34.2  34.2  32.2 32.2  32.2  12.6 12.6  12.6  31.3 31.3  31.3
DesignQueue:    2   11     7    14   12     3     2   15     1     3   21    19
********************************************************************************
```



```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #74 Tunnel Road / SR 13
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.841
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       17.5
Optimal Cycle:       66              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include            Ovl
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       0  0  2  0  1    2  0  1  0  0    0  0  0  0  0    1  0  0  0  2
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 7:00 AM - 9:00 AM
Base Vol:       0 1293   435   487  608     0     0    0     0   205    0   307
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1293   435   487  608     0     0    0     0   205    0   307
Added Vol:      0  299     0    17   16     0     0    0     0     0    0     0
Future:         0   80     0    60   70     0     0    0     0     0    0    20
Initial Fut:    0 1672   435   564  694     0     0    0     0   205    0   327
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1672   435   564  694     0     0    0     0   205    0   327
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1672   435   564  694     0     0    0     0   205    0   327
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1672   435   564  694     0     0    0     0   205    0   327
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.85  0.92 1.00  1.00  1.00 1.00  1.00  0.95 1.00  0.75
Lanes:       0.00 2.00  1.00  2.00 1.00  0.00  0.00 0.00  0.00  1.00 0.00  2.00
Final Sat.:     0 3610  1615  3502 1900     0     0    0     0  1805    0  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.46  0.27  0.16 0.37  0.00  0.00 0.00  0.00  0.11 0.00  0.12
Crit Moves:       ****        ****                                ****
Green/Cycle: 0.00 0.55  0.55  0.19 0.74  0.00  0.00 0.00  0.00  0.13 0.00  0.33
Volume/Cap:  0.00 0.84  0.49  0.84 0.49  0.00  0.00 0.00  0.00  0.84 0.00  0.35
Delay/Veh:    0.0 15.7   9.4  34.7  3.7   0.0   0.0  0.0   0.0  49.7  0.0  16.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 15.7   9.4  34.7  3.7   0.0   0.0  0.0   0.0  49.7  0.0  16.9
DesignQueue:    0   31     8    17    7     0     0    0     0     7    0     8
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #167 Piedmont Avenue / Channing Way
********************************************************************************
Average Delay (sec/veh):     16.5          Worst Case Level Of Service:        F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      65  457    24    23  308    38    25   19    23    20   58    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   65  457    24    23  308    38    25   19    23    20   58    18
Added Vol:     35  160     0     0   14    42     0    0     5     0    0     0
Future:        11   78     4     4   52     6     4    3     4     3   10     3
Initial Fut:  111  695    28    27  374    86    29   22    32    23   68    21
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   111  695    28    27  374    86    29   22    32    23   68    21
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   111  695    28    27  374    86    29   22    32    23   68    21
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  460 xxxx xxxxx   723 xxxx xxxxx  1447 1416   417  1429 1445   709
Potent Cap.: 1112 xxxx xxxxx   889 xxxx xxxxx   111  139   640   114  133   438
Move Cap.:   1112 xxxx xxxxx   889 xxxx xxxxx    51  120   640    84  115   438
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  8.6 xxxx xxxxx   9.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  103 xxxxx  xxxx  123 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  117 xxxxx xxxxx  126 xxxxx
Shared LOS:     *    *     *     *    *     *     *    F     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx            116.6            126.4
ApproachLOS:        *                *                F                F
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  AM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1121 Highland Place / Heart Avenue / Cyclotron Road
********************************************************************************
Average Delay (sec/veh):      1.4          Worst Case Level Of Service:        C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       4    1     0    12    0    57    12  281     4     0   53     2
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    4    1     0    12    0    57    12  281     4     0   53     2
Added Vol:      0    0     0     0    0     0     0  115     0     0   19     0
Future:         1    0     0     2    1     6     5   26     0     0  161    20
Initial Fut:    5    1     0    14    1    63    17  422     4     0  233    22
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     5    1     0    14    1    63    17  422     4     0  233    22
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     5    1     0    14    1    63    17  422     4     0  233    22
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx   7.1  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  734  713 xxxxx   703  704   244   255 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  338  360 xxxxx   355  364   800  1322 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    308  355 xxxxx   351  359   800  1322 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.:  315 xxxx xxxxx  xxxx  642 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 16.7 xxxx xxxxx xxxxx 11.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     C    *     *     *    B     *     *    *     *     *    *     *
ApproachDel:      16.7             11.4            xxxxxx           xxxxxx
ApproachLOS:        C                B                *                *
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1122 Stadium Rim Road / Canyon Road
********************************************************************************
Average Delay (sec/veh):      0.1          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    0  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  246     4     0  134     0     0    0     0     1    0     2
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  246     4     0  134     0     0    0     0     1    0     2
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0   43     1     0   23     0     0    0     0     0    0     0
Initial Fut:    0  289     5     0  157     0     0    0     0     1    0     2
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  289     5     0  157     0     0    0     0     1    0     2
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  289     5     0  157     0     0    0     0     1    0     2
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   449 xxxx   292
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   572 xxxx   752
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   572 xxxx   752
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  681 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 10.3 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    B     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             10.3
ApproachLOS:        *                *                *                B
```

Variant—P.M. Peak Hour

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Marin Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):         90               Critical Vol./Cap. (X):        1.167
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):        96.9
Optimal Cycle:      180               Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     227 1022   114   169  659    18    18  656   137   145  736   154
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  227 1022   114   169  659    18    18  656   137   145  736   154
Added Vol:      5  126     3     1   21     0     0    3     1     1   18    19
Future:        30  209    50    90  221    28    27  181    10    47  163    90
Initial Fut:  262 1357   167   260  901    46    45  840   148   193  917   263
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   262 1357   167   260  901    46    45  840   148   193  917   263
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  262 1357   167   260  901    46    45  840   148   193  917   263
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   262 1357   167   260  901    46    45  840   148   193  917   263
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.94  0.94  0.95 0.93  0.93  0.95 0.92  0.92
Lanes:       1.00 1.78  0.22  1.00 1.90  0.10  1.00 1.70  0.30  1.00 1.55  0.45
Final Sat.:  1805 3163   389  1805 3411   174  1805 3002   529  1805 2713   778
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.43  0.43  0.14 0.26  0.26  0.02 0.28  0.28  0.11 0.34  0.34
Crit Moves:       ****        ****                   ****       ****
Green/Cycle: 0.17 0.37  0.37  0.12 0.32  0.32  0.02 0.24  0.24  0.09 0.31  0.31
Volume/Cap:  0.83 1.17  1.17  1.17 0.83  0.83  1.10 1.17  1.17  1.17 1.10  1.10
Delay/Veh:   53.1  112 112.4 152.4 34.0  34.0 214.0  122 122.2 163.0 88.5  88.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  53.1  112 112.4 152.4 34.0  34.0 214.0  122 122.2 163.0 88.5  88.5
DesignQueue:   11   48     6    12   33     2     2   34     6     9   35    10
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Marin Avenue / The Alameda
********************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.869
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        22.4
Optimal Cycle:       75               Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    25   25   25    25   25   25    23   23   23    23   23   23
Lanes:        0  1  0  1  0    0  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     316  322     1    43  178    77    50  534   193    17  480    69
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  316  322     1    43  178    77    50  534   193    17  480    69
Added Vol:     21    6     5     0    1     0     0    5     1     1   16     0
Future:       130  110    10    10   30    70    20  200    80    10   70    10
Initial Fut:  467  438    16    53  209   147    70  739   274    28  566    79
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   467  438    16    53  209   147    70  739   274    28  566    79
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  467  438    16    53  209   147    70  739   274    28  566    79
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   467  438    16    53  209   147    70  739   274    28  566    79
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.61 0.61  0.61  0.70 0.70  0.70  0.78 0.78  0.78  0.80 0.80  0.80
Lanes:       1.00 0.96  0.04  0.26 1.02  0.72  0.13 1.36  0.51  0.08 1.69  0.23
Final Sat.:  1152 1111    41   347 1366   961   192 2031   753   126 2549   356
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.41 0.39  0.39  0.15 0.15  0.15  0.36 0.36  0.36  0.22 0.22  0.22
Crit Moves:  ****                                    ****
Green/Cycle: 0.47 0.47  0.47  0.47 0.47  0.47  0.42 0.42  0.42  0.42 0.42  0.42
Volume/Cap:  0.87 0.84  0.84  0.33 0.33  0.33  0.87 0.87  0.87  0.53 0.53  0.53
Delay/Veh:   26.4 24.5  24.5  12.4 12.4  12.4  26.9 26.9  26.9  16.8 16.8  16.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  26.4 24.5  24.5  12.4 12.4  12.4  26.9 26.9  26.9  16.8 16.8  16.8
DesignQueue:   10   10     0     1    4     3     2   18     7     1   13     2
********************************************************************************
```

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------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                            PM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #3 Gilman Street / Sixth Street
******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        1.267
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       128.7
Optimal Cycle:      180              Level Of Service:                  F
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   19   19    19    19   19    19    19   19    19    19   19    19
Lanes:       0  0  1! 0  0    0  1  0  1  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     346   46   159    24   47    52    28  497   109    53  489    11
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  346   46   159    24   47    52    28  497   109    53  489    11
Added Vol:      9    0     0     0    0     0     0    0     2     0    1     0
PasserByVol:  120    0    93    20   90     0     0  193   180   122   41     0
Initial Fut:  475   46   252    44  137    52    28  690   291   175  531    11
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   475   46   252    44  137    52    28  690   291   175  531    11
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  475   46   252    44  137    52    28  690   291   175  531    11
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   475   46   252    44  137    52    28  690   291   175  531    11
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.96 0.65  0.65  0.79 0.79  0.79  0.94 0.94  0.94  0.61 0.61  0.61
Lanes:       0.52 0.07  0.41  0.38 1.17  0.45  0.03 0.68  0.29  0.24 0.74  0.02
Final Sat.:   946   92   502   564 1755   666    49 1216   513   282  857    18
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.50 0.50  0.50  0.08 0.08  0.08  0.57 0.57  0.57  0.62 0.62  0.62
Crit Moves:       ****                                                 ****
Green/Cycle: 0.27 0.27  0.31  0.31 0.31  0.31  0.63 0.63  0.63  0.63 0.63  0.63
Volume/Cap:  1.85 1.85  1.60  0.25 0.25  0.25  0.90 0.90  0.90  0.99 0.99  0.99
Delay/Veh:  417.0  417 302.4  18.5 18.5  18.5  22.9 22.9  22.9  42.9 42.9  42.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 417.0  417 302.4  18.5 18.5  18.5  22.9 22.9  22.9  42.9 42.9  42.9
DesignQueue:   15    1     7     1    4     1     0   12     5     3    9     0
******************************************************************************
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------------------------------------------------------------------------------
                        365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                            PM Peak Hour
------------------------------------------------------------------------------
                   Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #4 Gilman Street / San Pablo Avenue
******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        1.073
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):        69.2
Optimal Cycle:      180              Level Of Service:                  E
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    4   35    35     4   35    35    31   31    31    31   31    31
Lanes:       1  0  1  1  0    1  0  1  1  0    0  1  0  1  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     140 1057    87   126  830   112   174  345   155    40  233    82
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  140 1057    87   126  830   112   174  345   155    40  233    82
Added Vol:      1  135     0     0   23     0     0    0     0     0    0     0
PasserByVol:   60  183    40    20  180    30   107   50   120    10   30    44
Initial Fut:  201 1375   127   146 1033   142   281  395   275    50  263   126
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   201 1375   127   146 1033   142   281  395   275    50  263   126
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  201 1375   127   146 1033   142   281  395   275    50  263   126
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   201 1375   127   146 1033   142   281  395   275    50  263   126
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.57 0.57  0.57  0.67 0.67  0.67
Lanes:       1.00 1.83  0.17  1.00 1.76  0.24  0.59 0.83  0.58  0.11 0.60  0.29
Final Sat.:  1805 3262   301  1805 3117   428   636  894   622   145  764   366
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.42  0.42  0.08 0.33  0.33  0.44 0.44  0.44  0.34 0.34  0.34
Crit Moves:       ****        ****                  ****
Green/Cycle: 0.12 0.39  0.39  0.08 0.35  0.35  0.41 0.41  0.41  0.41 0.41  0.41
Volume/Cap:  0.94 1.07  1.07  1.07 0.95  0.95  1.07 1.07  1.07  0.84 0.84  0.84
Delay/Veh:   91.9 76.6  76.6 144.3 47.2  47.2  81.2 81.2  81.2  41.0 41.0  41.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  91.9 76.6  76.6 144.3 47.2  47.2  81.2 81.2  81.2  41.0 41.0  41.0
DesignQueue:   10   52     5     8   41     6    10   14    10     2    9     4
******************************************************************************
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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Rose Street / Shattuck Avenue
********************************************************************************
Cycle (sec):          70              Critical Vol./Cap. (X):         0.759
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        16.3
Optimal Cycle:        52              Level Of Service:                  B
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   17   17    17   17   17    17   27   27    27   27   27    27
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     159  641    14  112  444    26   69  253    49   29  214   228
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  159  641    14  112  444    26   69  253    49   29  214   228
Added Vol:      0   10     0    1    2     0    0    0     0    0    0     4
Future:        60  230    20   10  220    10   10   10    30   20   10    10
Initial Fut:  219  881    34  123  666    36   79  263    79   49  224   242
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   219  881    34  123  666    36   79  263    79   49  224   242
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  219  881    34  123  666    36   79  263    79   49  224   242
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   219  881    34  123  666    36   79  263    79   49  224   242
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.32 0.94  0.94 0.23 0.94  0.94 0.77 0.77  0.85 0.88 0.88  0.88
Lanes:       1.00 1.93  0.07 1.00 1.90  0.10 0.23 0.77  1.00 0.10 0.43  0.47
Final Sat.:   602 3455   133  428 3397   184  338 1124  1615  159  726   784
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.36 0.25  0.25 0.29 0.20  0.20 0.23 0.23  0.05 0.31 0.31  0.31
Crit Moves:  ****                                                 ****
Green/Cycle: 0.48 0.48  0.48 0.48 0.48  0.48 0.41 0.41  0.41 0.41 0.41  0.41
Volume/Cap:  0.76 0.53  0.53 0.60 0.41  0.41 0.58 0.58  0.12 0.76 0.76  0.76
Delay/Veh:   26.0 13.1  13.1 18.2 12.0  12.0 17.5 17.5  13.0 22.8 22.8  22.8
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  26.0 13.1  13.1 18.2 12.0  12.0 17.5 17.5  13.0 22.8 22.8  22.8
DesignQueue:    5   19     1    3   14     1    2    6     2    1    6     6
********************************************************************************
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #6 Cedar Street / Martin Luther King Way
********************************************************************************
Cycle (sec):          65              Critical Vol./Cap. (X):         1.088
Loss Time (sec):       8 (Y+R =  5 sec) Average Delay (sec/veh):        51.7
Optimal Cycle:       180              Level Of Service:                  D
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   20   20    20   20   20    20   20   20    20   20   20    20
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      53  614    65   30  541    12   20  297    57   68  296    65
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   53  614    65   30  541    12   20  297    57   68  296    65
Added Vol:      2   28     4    0    3     0    0    2     0    1   13     0
Future:        20  210    30   20   80    10   10  110    10   10   30    10
Initial Fut:   75  852    99   50  624    22   30  409    67   79  339    75
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    75  852    99   50  624    22   30  409    67   79  339    75
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   75  852    99   50  624    22   30  409    67   79  339    75
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    75  852    99   50  624    22   30  409    67   79  339    75
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.90 0.90  0.90 0.88 0.88  0.88 0.93 0.93  0.93 0.73 0.73  0.73
Lanes:       0.07 0.83  0.10 0.07 0.90  0.03 0.06 0.81  0.13 0.16 0.69  0.15
Final Sat.:   125 1419   165  120 1503    53  105 1433   235  223  958   212
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.60 0.60  0.60 0.42 0.42  0.42 0.29 0.29  0.29 0.35 0.35  0.35
Crit Moves:       ****                                             ****
Green/Cycle: 0.55 0.55  0.55 0.55 0.55  0.55 0.33 0.33  0.33 0.33 0.33  0.33
Volume/Cap:  1.09 1.09  1.09 0.75 0.75  0.75 0.88 0.88  0.88 1.09 1.09  1.09
Delay/Veh:   66.2 66.2  66.2 13.2 13.2  13.2 37.9 37.9  37.9 90.2 90.2  90.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  66.2 66.2  66.2 13.2 13.2  13.2 37.9 37.9  37.9 90.2 90.2  90.2
DesignQueue:    1   16     2    1   11     0    1   11     2    2    9     2
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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #7 Cedar Street / Shattuck Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.765
Loss Time (sec):      8 (Y+R =  5 sec) Average Delay (sec/veh):       16.8
Optimal Cycle:       52              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   20   20    20   20   20    20   22   22    22   22   22    22
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:    138  795    56  144  619    72   86  275    67   59  341   150
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 138  795    56  144  619    72   86  275    67   59  341   150
Added Vol:     0    8     0    0    1     0    0    6     0    1   14     1
Future:       20  230    40   20  210    10   10   80    40   60   20    40
Initial Fut: 158 1033    96  164  830    82   96  361   107  120  375   191
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  158 1033    96  164  830    82   96  361   107  120  375   191
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 158 1033    96  164  830    82   96  361   107  120  375   191
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  158 1033    96  164  830    82   96  361   107  120  375   191
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.31 0.94  0.94 0.24 0.94  0.94 0.18 0.97  0.97 0.24 0.95  0.95
Lanes:      1.00 1.83  0.17 1.00 1.82  0.18 1.00 0.77  0.23 1.00 0.66  0.34
Final Sat.:  595 3260   303  460 3243   320  346 1416   420  462 1195   608
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.27 0.32  0.32 0.36 0.26  0.26 0.28 0.25  0.25 0.26 0.31  0.31
Crit Moves:                 ****                                ****
Green/Cycle: 0.54 0.53  0.53 0.53 0.53  0.53 0.34 0.34  0.34 0.34 0.34  0.34
Volume/Cap: 0.49 0.60  0.60 0.67 0.48  0.48 0.82 0.75  0.75 0.77 0.93  0.93
Delay/Veh:   7.5  4.0   4.0 16.5  3.2   3.2 64.7 27.3  27.3 48.9 43.1  43.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  7.5  4.0   4.0 16.5  3.2   3.2 64.7 27.3  27.3 48.9 43.1  43.1
DesignQueue:   3   19     2    3   15     1    2    9     3    3   10     5
********************************************************************************
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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Cedar Street / Oxford Street
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        1.104
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       62.9
Optimal Cycle:      180              Level Of Service:                  E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16    16   16   16    16   16   16    16   16   16    16
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     91  464    81   17  196    17   18  307    57   61  340    31
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  91  464    81   17  196    17   18  307    57   61  340    31
Added Vol:    17  112     0    0   14     2    4    0     2    0   -3     0
future:       40   80    20   10   10     0   20  120    40   50  100    10
Initial Fut: 148  656   101   27  220    19   42  427    99  111  437    41
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  148  656   101   27  220    19   42  427    99  111  437    41
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 148  656   101   27  220    19   42  427    99  111  437    41
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  148  656   101   27  220    19   42  427    99  111  437    41
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.88 0.88  0.88 0.89 0.89  0.89 0.91 0.91  0.91 0.72 0.72  0.72
Lanes:      0.16 0.73  0.11 0.10 0.83  0.07 0.07 0.76  0.17 0.19 0.74  0.07
Final Sat.:  274 1214   187  173 1406   121  128 1305   303  259 1021    96
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.54 0.54  0.54 0.16 0.16  0.16 0.33 0.33  0.33 0.43 0.43  0.43
Crit Moves:      ****                                                ****
Green/Cycle: 0.49 0.49  0.49 0.49 0.49  0.49 0.39 0.39  0.39 0.39 0.39  0.39
Volume/Cap: 1.10 1.10  1.10 0.32 0.32  0.32 0.84 0.84  0.84 1.10 1.10  1.10
Delay/Veh:  80.5 80.5  80.5 11.1 11.1  11.1 30.5 30.5  30.5 90.5 90.5  90.5
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 80.5 80.5  80.5 11.1 11.1  11.1 30.5 30.5  30.5 90.5 90.5  90.5
DesignQueue:   3   14     2    1    4     0    1   10     2    3   11     1
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Cedar Street / Euclid Avenue

Cycle (sec):	60	Critical Vol./Cap. (X):	0.637
Loss Time (sec):	8 (Y+R = 5 sec)	Average Delay (sec/veh):	14.0
Optimal Cycle:	42	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	17	17	17	17	17	17	17	17	17	17	17	0
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 1 0 0 0		
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	90	226	29	7	127	44	51	180	49	18	91	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	90	226	29	7	127	44	51	180	49	18	91	0
Added Vol:	0	3	0	0	1	0	3	0	0	0	-2	0
Future:	50	30	0	0	10	20	40	100	40	10	70	0
Initial Fut:	140	259	29	7	138	64	94	280	89	28	159	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	140	259	29	7	138	64	94	280	89	28	159	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	140	259	29	7	138	64	94	280	89	28	159	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	140	259	29	7	138	64	94	280	89	28	159	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.82	0.82	0.82	0.95	0.95	0.95	0.87	0.87	0.87	0.91	0.91	1.00
Lanes:	0.33	0.60	0.07	0.03	0.66	0.31	0.20	0.61	0.19	0.15	0.85	0.00
Final Sat.:	512	948	106	60	1186	550	337	1004	319	259	1468	0
Capacity Analysis Module:												
Vol/Sat:	0.27	0.27	0.27	0.12	0.12	0.12	0.28	0.28	0.28	0.11	0.11	0.00
Crit Moves:		****						****				
Green/Cycle:	0.43	0.43	0.43	0.43	0.43	0.43	0.44	0.44	0.44	0.44	0.44	0.00
Volume/Cap:	0.64	0.64	0.64	0.27	0.27	0.27	0.64	0.64	0.64	0.25	0.25	0.00
Delay/Veh:	15.5	15.5	15.5	11.3	11.3	11.3	15.0	15.0	15.0	10.8	10.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.5	15.5	15.5	11.3	11.3	11.3	15.0	15.0	15.0	10.8	10.8	0.0
DesignQueue:	3	5	1	0	3	1	2	6	2	1	3	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #10 Grizzly Peak Blvd / Centennial Drive

Cycle (sec):	100	Critical Vol./Cap. (X):	0.944
Loss Time (sec):	0 (Y+R = 4 sec)	Average Delay (sec/veh):	29.3
Optimal Cycle:	0	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM												
Base Vol:	162	65	250	33	30	8	3	159	45	22	111	25
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	162	65	250	33	30	8	3	159	45	22	111	25
Added Vol:	13	0	50	0	0	0	0	0	0	5	0	0
Future:	11	0	33	0	0	0	0	22	22	11	11	0
Initial Fut:	186	65	333	33	30	8	3	181	67	38	122	25
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	207	72	370	37	33	9	3	201	74	42	136	28
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	207	72	370	37	33	9	3	201	74	42	136	28
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	207	72	370	37	33	9	3	201	74	42	136	28
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.32	0.11	0.57	0.47	0.42	0.11	0.01	0.72	0.27	0.21	0.66	0.13
Final Sat.:	219	77	392	237	216	58	7	412	152	112	359	73
Capacity Analysis Module:												
Vol/Sat:	0.94	0.94	0.94	0.15	0.15	0.15	0.49	0.49	0.49	0.38	0.38	0.38
Crit Moves:		****		****				****			****	
Delay/Veh:	43.2	43.2	43.2	10.5	10.5	10.5	14.4	14.4	14.4	12.9	12.9	12.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	43.2	43.2	43.2	10.5	10.5	10.5	14.4	14.4	14.4	12.9	12.9	12.9
LOS by Move:	E	E	E	B	B	B	B	B	B	B	B	B
ApproachDel:		43.2			10.5			14.4			12.9	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		43.2			10.5			14.4			12.9	
LOS by Appr:		E			B			B			B	

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                               365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                   PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #11 Hearst Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.940
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        26.4
Optimal Cycle:      107               Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   22   22    22   22   22    22   22   22    22   22   22    22
Lanes:       1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     34  715    63  117  537    54   67  232    20  122  321   136
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  34  715    63  117  537    54   67  232    20  122  321   136
Added Vol:    22    6    -2    1    2     0    0    5     3   56   39     3
Future:       22  176    33   66  264    44   55   22    22   55   22    99
Initial Fut:  78  897    94  184  803    98  122  259    45  233  382   238
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   78  897    94  184  803    98  122  259    45  233  382   238
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  78  897    94  184  803    98  122  259    45  233  382   238
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   78  897    94  184  803    98  122  259    45  233  382   238
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.24 0.94  0.94 0.20 0.93  0.93 0.53 0.53  0.53 0.63 0.63  0.63
Lanes:       1.00 1.81  0.19 1.00 1.78  0.22 0.57 1.22  0.21 0.55 0.89  0.56
Final Sat.:   458 3222   338  380 3166   386  572 1214   211  656 1075   670
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17 0.28  0.28 0.48 0.25  0.25 0.21 0.21  0.21 0.36 0.36  0.36
Crit Moves:                  ****                                  ****
Green/Cycle: 0.41 0.41  0.41 0.41 0.41  0.41 0.39 0.39  0.39 0.39 0.39  0.39
Volume/Cap:  0.42 0.68  0.68 1.19 0.62  0.62 0.55 0.55  0.55 0.92 0.92  0.92
Delay/Veh:   15.3 12.5  12.5 143.3 11.5  11.5 20.7 20.7  20.7 36.9 36.9  36.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  15.3 12.5  12.5 143.3 11.5  11.5 20.7 20.7  20.7 36.9 36.9  36.9
DesignQueue:    2   24     2    5   21     3    3    7     1    6   10     6
********************************************************************************
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                               365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                   PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Hearst Avenue / Oxford Avenue
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        1.011
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        51.1
Optimal Cycle:      177               Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   19   19    19   19   19    19   22   22    22   22   22    22
Lanes:       1  0  1  1  0   0  1  0  1  0   0  1  0  1  0   1  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     80  743   315   30  458    25   23  267   115  313  478    52
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  80  743   315   30  458    25   23  267   115  313  478    52
Added Vol:    -1  103    14   17   48    24    2    2     0   68   75     5
Future:       33  121    44   11   77    22    0   88    44   44 1232    11
Initial Fut: 112  967   373   58  583    71   25  357   159  425 1785    68
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  112  967   373   58  583    71   25  357   159  425 1785    68
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 112  967   373   58  583    71   25  357   159  425 1785    68
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  112  967   373   58  583    71   25  357   159  425 1785    68
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.17 0.91  0.91 0.89 0.89  0.89 0.87 0.87  0.87 0.95 0.95  0.95
Lanes:       1.00 1.44  0.56 0.16 1.64  0.20 0.09 1.32  0.59 1.00 1.93  0.07
Final Sat.:   319 2496   963  277 2781   339  152 2175   969 1798 3464   132
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.35 0.39  0.39 0.21 0.21  0.21 0.16 0.16  0.16 0.24 0.52  0.52
Crit Moves:       ****                                              ****
Green/Cycle: 0.32 0.32  0.32 0.32 0.32  0.32 0.58 0.58  0.58 0.58 0.58  0.58
Volume/Cap:  1.10 1.22  1.22 0.66 0.66  0.66 0.29 0.29  0.29 0.41 0.90  0.90
Delay/Veh:  144.8  132 131.5 24.6 24.6  24.6  8.5  8.5   8.5  9.1 19.4  19.4
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 144.8  132 131.5 24.6 24.6  24.6  8.5  8.5   8.5  9.1 19.4  19.4
DesignQueue:    3   30    12    2   17     2    0    7     3    8   36     1
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                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Hearst Avenue / Spruce Street
********************************************************************************
Average Delay (sec/veh):      1.0          Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  1  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:        0    0     0    11    0    48    34  579     0     0  792    13
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0    11    0    48    34  579     0     0  792    13
Added Vol:       0    0     0     1    0     0     0   33     0     0  149     6
Future:          0    0     0     0    0    20     0  130     0     0  170     0
Initial Fut:     0    0     0    12    0    68    34  742     0     0 1111    19
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0    12    0    68    34  742     0     0 1111    19
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0    12    0    68    34  742     0     0 1111    19
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1560 xxxx   565  1130 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   105 xxxx   473   626 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   101 xxxx   473   626 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  11.1 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     B    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  304 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 21.0 xxxxx  11.1 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    C     *     B    *     *     *    *     *
ApproachDel:     xxxxxx            21.0            xxxxxx           xxxxxx
ApproachLOS:        *                C                *                *
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #14 Hearst Avenue / Arch Street / Le Conte Avenue
********************************************************************************
Average Delay (sec/veh):      3.0          Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:        0    0     0     6    0   135   146  439     0     0  668     6
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0     6    0   135   146  439     0     0  668     6
Added Vol:       0    0     0     0    0     0     3   31     0     0  155     0
Future:          0    0     0     0    0    40    50  100     0     0  150     0
Initial Fut:     0    0     0     6    0   175   199  570     0     0  973     6
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0     6    0   175   199  570     0     0  973     6
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0     6    0   175   199  570     0     0  973     6
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.8 xxxx   6.9   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1659 xxxx   489   979 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx    90 xxxx   530   713 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx    71 xxxx   530   713 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx  12.0 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     B    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  436 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 19.0 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    C     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            19.0            xxxxxx           xxxxxx
ApproachLOS:        *                C                *                *
```

```
------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
******************************************************************************
Intersection #15 Hearst Avenue / Scenic Avenue
******************************************************************************
Average Delay (sec/veh):      1.3           Worst Case Level Of Service:       B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  0  0  1    0  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00-6:00 PM
Base Vol:        0    0     0     0    0   109     0  437     0     0  566    54
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0     0    0   109     0  437     0     0  566    54
Added Vol:       0    0     0     0    0    11     0    0     0     0  143     0
Future:          0    0     0     0    0    30     0  100     0     0  140    10
Initial Fut:     0    0     0     0    0   150     0  537     0     0  849    64
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0     0    0   150     0  537     0     0  849    64
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0     0    0   150     0  537     0     0  849    64
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx   457  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx   557  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx   557  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx  13.8 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     B     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx             13.8            xxxxxx           xxxxxx
ApproachLOS:        *                 B                *                *
```



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------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #16 Hearst Avenue / Euclid Avenue
******************************************************************************
Cycle (sec):          80                Critical Vol./Cap. (X):        0.680
Loss Time (sec):      12 (Y+R =  3 sec) Average Delay (sec/veh):        18.8
Optimal Cycle:        54                Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:      0    0     0    25    0    25     5   16     0    16   16    16
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  1  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:        4    0     1    57    0   115   120  307     0     2  503    23
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     4    0     1    57    0   115   120  307     0     2  503    23
Added Vol:       0    0     0     0    0     0     0   31     0     0  132     3
Future:          0    0     0    11    0    44    44   88     0     0  143    11
Initial Fut:     4    0     1    68    0   159   164  426     0     2  778    37
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      4    0     1    68    0   159   164  426     0     2  778    37
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:     4    0     1    68    0   159   164  426     0     2  778    37
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:      4    0     1    68    0   159   164  426     0     2  778    37
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.86 1.00  0.86  0.82 1.00  0.82  0.56 1.00  1.00  0.99 0.99  0.99
Lanes:        0.80 0.00  0.20  0.30 0.00  0.70  1.00 1.00  0.00  0.01 0.95  0.04
Final Sat.:   1306    0   326   467    0  1091  1066 1900     0     5 1798    86
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.00  0.00  0.15 0.00  0.15  0.15 0.22  0.00  0.43 0.43  0.43
Crit Moves:                    ****                                   ****
Green/Cycle:  0.31 0.00  0.31  0.31 0.00  0.31  0.54 0.54  0.00  0.54 0.54  0.54
Volume/Cap:   0.01 0.00  0.01  0.47 0.00  0.47  0.29 0.42  0.00  0.80 0.80  0.80
Delay/Veh:    19.0  0.0  19.0  25.3  0.0  25.3  11.4 12.3   0.0  21.9 21.9  21.9
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   19.0  0.0  19.0  25.3  0.0  25.3  11.4 12.3   0.0  21.9 21.9  21.9
DesignQueue:     0    0     0     2    0     5     3    9     0     0   18     1
******************************************************************************
```

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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #17 Hearst Avenue / Le Roy Avenue
*******************************************************************************
Average Delay (sec/veh):      1.5          Worst Case Level Of Service:       C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:       0    0     0    12    0    56    38  355     0     0  523    21
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    12    0    56    38  355     0     0  523    21
Added Vol:      0    0     0     0    0     0     0   31     0     0  135     0
Future:         0    0     0     0    0    10    20   90     0     0  140    10
Initial Fut:    0    0     0    12    0    66    58  476     0     0  798    31
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    12    0    66    58  476     0     0  798    31
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0    12    0    66    58  476     0     0  798    31
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1396 xxxx   814   829 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   146 xxxx   381   811 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   138 xxxx   381   811 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.8 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  300 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 21.2 xxxxx   9.8 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    C     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            21.2            xxxxxx           xxxxxx
ApproachLOS:        *                C                *                *
```



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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #18 Hearst Avenue / Gayley Road / LaLoma Avenue
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        1.213
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        95.3
Optimal Cycle:      180              Level Of Service:                 F
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    17   17    17    17   17    17
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:     318  288    19     4  203    49    28   52   288    69  197    40
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  318  288    19     4  203    49    28   52   288    69  197    40
Added Vol:     46   28    11     0   12     0     0   11    21    14   90     0
Future:        99   33    11     0    0    22    22   33    66    11   66    11
Initial Fut:  463  349    41     4  215    71    50   96   375    94  353    51
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   463  349    41     4  215    71    50   96   375    94  353    51
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  463  349    41     4  215    71    50   96   375    94  353    51
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   463  349    41     4  215    71    50   96   375    94  353    51
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.67 0.67  0.67  0.96 0.96  0.96  0.67 0.67  0.67  0.73 0.73  0.85
Lanes:       0.54 0.41  0.05  0.01 0.75  0.24  0.10 0.18  0.72  0.21 0.79  1.00
Final Sat.:   693  522    61    25 1351   446   123  236   922   292 1097  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.67 0.67  0.67  0.16 0.16  0.16  0.41 0.41  0.41  0.32 0.32  0.03
Crit Moves:       ****                              ****
Green/Cycle: 0.55 0.55  0.55  0.55 0.55  0.55  0.34 0.34  0.34  0.34 0.34  0.34
Volume/Cap:  1.21 1.21  1.21  0.29 0.29  0.29  1.21 1.21  1.21  0.96 0.96  0.09
Delay/Veh:  124.6  125 124.6   9.1  9.1   9.1 138.0  138 138.0  54.8 54.8  15.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 124.6  125 124.6   9.1  9.1   9.1 138.0  138 138.0  54.8 54.8  15.6
DesignQueue:    9    7     1     0    4     1     1    3    10     3   10     1
*******************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #19 Berkeley Way / Oxford Street
********************************************************************************
Cycle (sec):          75                Critical Vol./Cap. (X):         0.560
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):         10.0
Optimal Cycle:        46                Level Of Service:                   A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18   18   18    18   20   20    20   20   20    20
Lanes:       1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     48 1039     3    4  890    22   72    2    51   29   18    42
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  48 1039     3    4  890    22   72    2    51   29   18    42
Added Vol:     5   94     0    0  113     3   23    0    34    0    0     0
Future:       20  160     0    0  170     0   10    0    10   20    0    10
Initial Fut:  73 1293     3    4 1173    25  105    2    95   49   18    52
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   73 1293     3    4 1173    25  105    2    95   49   18    52
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  73 1293     3    4 1173    25  105    2    95   49   18    52
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   73 1293     3    4 1173    25  105    2    95   49   18    52
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.18 0.95  0.95 0.15 0.95  0.95 0.75 0.75  0.75 0.75 0.89  0.89
Lanes:      1.00 1.99  0.01 1.00 1.96  0.04 0.52 0.01  0.47 1.00 0.26  0.74
Final Sat.:  342 3602     8  293 3524    75  741   14   671 1423  434  1255
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.21 0.36  0.36 0.01 0.33  0.33 0.14 0.14  0.14 0.03 0.04  0.04
Crit Moves:      ****                            ****
Green/Cycle: 0.63 0.63  0.63 0.63 0.63  0.63 0.27 0.27  0.27 0.27 0.27  0.27
Volume/Cap:  0.34 0.57  0.57 0.02 0.53  0.53 0.53 0.53  0.53 0.13 0.16  0.16
Delay/Veh:    7.6  8.5   8.5  5.3  8.1   8.1 24.9 24.9  24.9 21.0 21.2  21.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   7.6  8.5   8.5  5.3  8.1   8.1 24.9 24.9  24.9 21.0 21.2  21.2
DesignQueue:    1   22     0    0   20     0    3    0     3    2    1     2
********************************************************************************
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #20 University Avenue / Sixth Street
********************************************************************************
Cycle (sec):         128                Critical Vol./Cap. (X):         1.049
Loss Time (sec):      16 (Y+R =  5 sec) Average Delay (sec/veh):        107.9
Optimal Cycle:       180                Level Of Service:                   F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    6   23    23    0   23    23    6   15    15    6   15    15
Lanes:       1  0  1  0  1   1  0  1  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:    343  353    48  101  239   465  163  827   212   42 1205    33
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 343  353    48  101  239   465  163  827   212   42 1205    33
Added Vol:     0    4     2    0   19     8    1   38     0    5  277     0
Future:       10   70    40  100  130   100   20  200    20   20  120    10
Initial Fut: 353  427    90  201  388   573  184 1065   232   67 1602    43
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  353  427    90  201  388   573  184 1065   232   67 1602    43
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 353  427    90  201  388   573  184 1065   232   67 1602    43
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  353  427    90  201  388   573  184 1065   232   67 1602    43
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.98 1.00  0.85 1.00 1.00  0.85 0.95 0.92  0.92 0.95 0.95  0.95
Lanes:      1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.64  0.36 1.00 1.95  0.05
Final Sat.: 1856 1900  1615 1900 1900  1615 1805 2884   628 1805 3502    94
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.19 0.22  0.06 0.11 0.20  0.35 0.10 0.37  0.37 0.04 0.46  0.46
Crit Moves: ****                       ****  ****                  ****
Green/Cycle: 0.33 0.33  0.33 0.28 0.28  0.28 0.08 0.39  0.39 0.05 0.36  0.36
Volume/Cap:  0.58 0.68  0.17 0.38 0.73  1.27 1.27 0.94  0.94 0.79 1.27  1.27
Delay/Veh:   57.3 42.9  31.1 39.2 50.3 183.4 222.8 50.4 50.4 112.4  168 167.9
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  57.3 42.9  31.1 39.2 50.3 183.4 222.8 50.4 50.4 112.4  168 167.9
DesignQueue:   22   22     4   11   21    32   12   50    11    5   82     2
********************************************************************************
```

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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #21 University Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):        128              Critical Vol./Cap. (X):        1.113
Loss Time (sec):     16 (Y+R =  4 sec) Average Delay (sec/veh):     199.1
Optimal Cycle:      180              Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     5   21    21     5   21    21     5   22    22     5   22    22
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     233  945    93   141  681    84    87  986   105    71  906   125
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  233  945    93   141  681    84    87  986   105    71  906   125
Added Vol:      1   19     1    12    8     0     0   39     0     6  281    89
Future:        50   90    10    20  220    60    90  190    80    10   60    20
Initial Fut:  284 1054   104   173  909   144   177 1215   185    87 1247   234
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   284 1054   104   173  909   144   177 1215   185    87 1247   234
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  284 1054   104   173  909   144   177 1215   185    87 1247   234
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   284 1054   104   173  909   144   177 1215   185    87 1247   234
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.95 0.93  0.93  0.95 0.93  0.93
Lanes:       1.00 1.82  0.18  1.00 1.73  0.27  1.00 1.74  0.26  1.00 1.68  0.32
Final Sat.:  1805 3243   320  1805 3051   483  1805 3070   467  1805 2967   557
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.33  0.33  0.10 0.30  0.30  0.10 0.40  0.40  0.05 0.42  0.42
Crit Moves:  ****                 ****         ****                  ****
Green/Cycle: 0.14 0.28  0.28  0.10 0.28  0.28  0.09 0.21  0.21  0.05 0.37  0.37
Volume/Cap:  1.14 1.16  1.16  1.01 1.06  1.06  1.14 1.88  1.88  0.97 1.14  1.14
Delay/Veh:  153.6  130 129.7 128.0 93.3  93.3 171.7  454 453.6 148.6  111 111.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 153.6  130 129.7 128.0 93.3  93.3 171.7  454 453.6 148.6  111 111.3
DesignQueue:   18   59     6    11   50     8    12   76    12     6   62    12
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #22 University Avenue / Martin Luther King Way
********************************************************************************
Cycle (sec):         85              Critical Vol./Cap. (X):        0.986
Loss Time (sec):     12 (Y+R =  5 sec) Average Delay (sec/veh):      42.5
Optimal Cycle:      180              Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     5   23    23    23   23    23    17   17    17    17   17    17
Lanes:        1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     282  902    78    46  702    77    80  679   134    71  727    81
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  282  902    78    46  702    77    80  679   134    71  727    81
Added Vol:     12   25     0     0    3     1     0   52     0     3  367     0
Future:        30  200    20    30   60    10    30  170    40    10   70    10
Initial Fut:  324 1127    98    76  765    88   110  901   174    84 1164    91
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   324 1127    98    76  765    88   110  901   174    84 1164    91
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  324 1127    98    76  765    88   110  901   174    84 1164    91
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   324 1127    98    76  765    88   110  901   174    84 1164    91
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.37 0.94  0.94  0.13 0.94  0.94  0.14 0.93  0.93  0.14 0.94  0.94
Lanes:       1.00 1.84  0.16  1.00 1.79  0.21  1.00 1.68  0.32  1.00 1.85  0.15
Final Sat.:   709 3281   285   251 3189   367   268 2953   570   268 3311   259
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.46 0.34  0.34  0.30 0.24  0.24  0.41 0.31  0.31  0.31 0.35  0.35
Crit Moves:  ****             ****             ****
Green/Cycle: 0.52 0.52  0.52  0.39 0.39  0.39  0.33 0.33  0.33  0.33 0.33  0.33
Volume/Cap:  0.88 0.66  0.66  0.78 0.62  0.62  1.23 0.92  0.92  0.94 1.05  1.05
Delay/Veh:   37.8 12.8  12.8  66.6 21.2  21.2 198.4 39.7  39.7 107.5 70.1  70.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  37.8 12.8  12.8  66.6 21.2  21.2 198.4 39.7  39.7 107.5 70.1  70.1
DesignQueue:   14   28     2     2   24     3     4   31     6     3   40     3
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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #23 University Avenue / Milvia Street
********************************************************************************
Cycle (sec):          75              Critical Vol./Cap. (X):        0.649
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       23.7
Optimal Cycle:        49              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:   21   21    21    21   21    21    20   20    20    20   20    20
Lanes:       1  0  0  1  0   0  0  1! 0  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:    127  218    44    13  102    74    47  649   108    22  651    33
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse: 127  218    44    13  102    74    47  649   108    22  651    33
Added Vol:     0    0     0     0    0     0     0   52     0     0  371     0
Future:       10   10    10    10   10    10    20  180    20    10   80    20
Initial Fut: 137  228    54    23  112    84    67  881   128    32 1102    53
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:  137  228    54    23  112    84    67  881   128    32 1102    53
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 137  228    54    23  112    84    67  881   128    32 1102    53
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:  137  228    54    23  112    84    67  881   128    32 1102    53
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 0.70 0.97  0.97  0.90 0.90  0.90  0.66 0.66  0.66  0.85 0.85  0.85
Lanes:      1.00 0.81  0.19  0.11 0.51  0.38  0.12 1.64  0.24  0.05 1.86  0.09
Final Sat.: 1336 1492   353   180  875   656   157 2064   300    87 2995   144
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.10 0.15  0.15  0.13 0.13  0.13  0.43 0.43  0.43  0.37 0.37  0.37
Crit Moves:      ****                              ****
Green/Cycle: 0.35 0.35  0.35  0.35 0.35  0.35  0.47 0.47  0.47  0.47 0.47  0.47
Volume/Cap:  0.30 0.44  0.44  0.37 0.37  0.37  0.90 0.90  0.90  0.78 0.78  0.78
Delay/Veh:   19.5 21.1  21.1  20.1 20.1  20.1  29.2 29.2  29.2  20.4 20.4  20.4
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  19.5 21.1  21.1  20.1 20.1  20.1  29.2 29.2  29.2  20.4 20.4  20.4
DesignQueue:    4    6     2     1    3     2     2   21     3     1   26     1
********************************************************************************
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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #24 University Avenue / SB Shattuck Avenue
********************************************************************************
Cycle (sec):          75              Critical Vol./Cap. (X):        0.953
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       24.6
Optimal Cycle:       116              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    16   16    16    16   16    16    16   16    16
Lanes:       0  0  0  0  0   0  1  1  1  0   1  0  1  1  0   0  1  0  1  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0     0    55  576   146   131  374   254    74  642   640
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0     0    55  576   146   131  374   254    74  642   640
Added Vol:     0    0     0     0   99    50     7   30    16     5  321     5
Future:        0    0     0    33  253    33    44  110    55    11   88   143
Initial Fut:   0    0     0    88  928   229   182  514   325    90 1051   788
User Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0     0    88  928   229   182  514   325    90 1051   788
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0    0     0    88  928   229   182  514   325    90 1051   788
PCE Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0    0     0    88  928   229   182  514   325    90 1051   788
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment: 1.00 1.00  1.00  0.77 0.77  0.77  0.17 0.81  0.81  0.68 0.68  0.68
Lanes:      0.00 0.00  0.00  0.21 2.24  0.55  1.00 1.23  0.77  0.14 1.63  1.23
Final Sat.:    0    0     0   312 3288   811   320 1875  1186   180 2099  1574
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.00  0.00  0.28 0.28  0.28  0.57 0.27  0.27  0.50 0.50  0.50
Crit Moves:                       ****        ****
Green/Cycle: 0.00 0.00  0.00  0.30 0.30  0.30  0.60 0.60  0.60  0.60 0.60  0.60
Volume/Cap:  0.00 0.00  0.00  0.95 0.95  0.95  0.95 0.46  0.46  0.84 0.84  0.84
Delay/Veh:    0.0  0.0   0.0  41.8 41.8  41.8  68.0  9.2   9.2  16.0 16.0  16.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0  41.8 41.8  41.8  68.0  9.2   9.2  16.0 16.0  16.0
DesignQueue:    0    0     0     3   29     7     3    9     6     2   19    15
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-------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #25 University Avenue / NB Shattuck Avenue
*******************************************************************************
Cycle (sec):         75                Critical Vol./Cap. (X):        0.623
Loss Time (sec):     15 (Y+R =  4 sec) Average Delay (sec/veh):        18.6
Optimal Cycle:       54                Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:   19    0    19    0    0     0    0   13     0    0   13     0
Lanes:        2  0  1! 0  1   0  0  0  0  0   0  0  2  0  0   0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:    938    0   208    0    0     0    0  454     0    0  433     0
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 938    0   208    0    0     0    0  454     0    0  433     0
Added Vol:   155    0    13    0    0     0    0   30     0    0  176     0
Future:      150    0    40    0    0     0    0    0     0    0   70     0
Initial Fut: 1243   0   261    0    0     0    0  484     0    0  679     0
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume: 1243    0   261    0    0     0    0  484     0    0  679     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 1243   0   261    0    0     0    0  484     0    0  679     0
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.: 1243    0   261    0    0     0    0  484     0    0  679     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.82 1.00  0.84 1.00 1.00  1.00 1.00 0.86  1.00 1.00 0.86  1.00
Lanes:      2.77 0.00  1.23 0.00 0.00  0.00 0.00 2.00  0.00 0.00 2.00  0.00
Final Sat.: 4290    0  1973    0    0     0    0 3249     0    0 3249     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.29 0.00  0.13 0.00 0.00  0.00 0.00 0.15  0.00 0.00 0.21  0.00
Crit Moves: ****                          ****                 ****
Green/Cycle: 0.46 0.00  0.46 0.00 0.00  0.00 0.00 0.34  0.00 0.00 0.34  0.00
Volume/Cap: 0.62 0.00  0.28 0.00 0.00  0.00 0.00 0.44  0.00 0.00 0.62  0.00
Delay/Veh:  16.4  0.0  12.5  0.0  0.0   0.0  0.0 20.8   0.0  0.0 23.6   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 16.4  0.0  12.5  0.0  0.0   0.0  0.0 20.8   0.0  0.0 23.6   0.0
DesignQueue:  30    0     6    0    0     0    0   14     0    0   20     0
*******************************************************************************
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-------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #26 University Avenue / Oxford Street
*******************************************************************************
Cycle (sec):         75                Critical Vol./Cap. (X):        0.898
Loss Time (sec):      4 (Y+R =  4 sec) Average Delay (sec/veh):        31.2
Optimal Cycle:      157                Level Of Service:                  C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Prot+Permit       Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18   18    18   18   18    18   18   18    18   18   18    18
Lanes:        1  0  1  1  0   1  0  1  1  0   1  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 12 Nov 2002 << 4:00 - 6:00 PM
Base Vol:    278  771    16   32  835   106  306   39   330    9   37    40
Growth Adj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 278  771    16   32  835   106  306   39   330    9   37    40
Added Vol:    90   75     0    0   55    92   25   -1    19   -2   -6    -2
Future:       55  143     0   11  176    33   22   11    22    0   11    11
Initial Fut: 423  989    16   43 1066   231  353   49   371    7   42    49
User Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  423  989    16   43 1066   231  353   49   371    7   42    49
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 423  989    16   43 1066   231  353   49   371    7   42    49
PCE Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  423  989    16   43 1066   231  353   49   371    7   42    49
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment: 0.40 0.85  0.85 0.24 0.83  0.83 0.59 0.59  0.77 0.83 0.83  0.83
Lanes:      1.00 1.97  0.03 1.00 1.64  0.36 1.76 0.24  1.00 0.07 0.43  0.50
Final Sat.:  764 3191    52  455 2598   563 1970  273  1454  112  675   787
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.55 0.31  0.31 0.09 0.41  0.41 0.18 0.18  0.26 0.06 0.06  0.06
Crit Moves: ****                 ****                  ****
Green/Cycle: 0.69 0.69  0.69 0.42 0.42  0.42 0.26 0.26  0.26 0.26 0.26  0.26
Volume/Cap: 0.81 0.45  0.45 0.23 0.98  0.98 0.69 0.69  0.98 0.24 0.24  0.24
Delay/Veh:  30.5  6.0   6.0 16.7 41.4  41.4 31.4 31.4  68.5 23.2 23.2  23.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 30.5  6.0   6.0 16.7 41.4  41.4 31.4 31.4  68.5 23.2 23.2  23.2
DesignQueue:  14   14     0    1   28     6   11    2    12    0    1     2
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #27 Univeristy Drive (East Gate)  / Gayley Road
********************************************************************************
Average Delay (sec/veh):      2.1          Worst Case Level Of Service:       C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0    0  0  0  1  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      59  552     0     0  505    52    41    0    81     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   59  552     0     0  505    52    41    0    81     0    0     0
Added Vol:     -2  104     0     0   50    -3   -19    0   -12     0    0     0
Future:        20  110     0     0   60    10    10    0    20     0    0     0
Initial Fut:   77  766     0     0  615    59    32    0    89     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    77  766     0     0  615    59    32    0    89     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    77  766     0     0  615    59    32    0    89     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  674 xxxx xxxxx  xxxx xxxx xxxxx  1565 xxxx   645  xxxx xxxx xxxxx
Potent Cap.:  927 xxxx xxxxx  xxxx xxxx xxxxx   124 xxxx   476  xxxx xxxx xxxxx
Move Cap.:    927 xxxx xxxxx  xxxx xxxx xxxxx   116 xxxx   476  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.2 xxxx xxxxx xxxxx xxxx xxxxx  47.4 xxxx  14.3 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     E    *     B     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             23.0            xxxxxx
ApproachLOS:        *                *                 C                *
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #28 Addison Street / Oxford Street
********************************************************************************
Average Delay (sec/veh):      2.8          Worst Case Level Of Service:       E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  2  0  0    0  0  1  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      32 1006     0     0  952    28    10    0   114     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   32 1006     0     0  952    28    10    0   114     0    0     0
Added Vol:      3  149     0     0   70     2    16    0    18     0    0     0
Future:        10  180     0     0  170    10     0    0    10     0    0     0
Initial Fut:   45 1335     0     0 1192    40    26    0   142     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    48 1420     0     0 1268    43    28    0   151     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:    48 1420     0     0 1268    43    28    0   151     0    0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  909 xxxx xxxxx  xxxx xxxx xxxxx  1691 xxxx    50  xxxx xxxx xxxxx
Potent Cap.:  577 xxxx xxxxx  xxxx xxxx xxxxx    61 xxxx   774  xxxx xxxx xxxxx
Move Cap.:    577 xxxx xxxxx  xxxx xxxx xxxxx    57 xxxx   774  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 11.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     *    *     *     *    *     *     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  264 xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 43.2 xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    E     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             43.2            xxxxxx
ApproachLOS:        *                *                 E                *
```

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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                               PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #29 Center Street / SB Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.636
Loss Time (sec):     12 (Y+R = 10 sec) Average Delay (sec/veh):      17.5
Optimal Cycle:       67              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0   30   30    30    0   17    17   25   25     0
Lanes:       0  0  0  0  0   0  1  1  1  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0     0   41  790   126    0  104   179   29  160     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0   41  790   126    0  104   179   29  160     0
Added Vol:     0    0     0    0  132     0    0    0     0   -2    2     0
Future:        0    0     0   10  230    40    0   50    30   30   40     0
Initial Fut:   0    0     0   51 1152   166    0  154   209   57  202     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0     0   51 1152   166    0  154   209   57  202     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0   51 1152   166    0  154   209   57  202     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0   51 1152   166    0  154   209   57  202     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  1.00 0.79 0.79  0.79 1.00 0.83  0.83 0.79 0.79  1.00
Lanes:       0.00 0.00  0.00 0.11 2.53  0.36 0.00 0.42  0.58 0.22 0.78  0.00
Final Sat.:    0    0     0  168 3788   546    0  669   908  329 1164     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.30 0.30  0.30 0.00 0.23  0.23 0.17 0.17  0.00
Crit Moves:                       ****              ****
Green/Cycle: 0.00 0.00  0.00 0.40 0.40  0.40 0.00 0.29  0.29 0.43 0.43  0.00
Volume/Cap:  0.00 0.00  0.00 0.76 0.76  0.76 0.00 0.78  0.78 0.41 0.41  0.00
Delay/Veh:    0.0  0.0   0.0 13.9 13.9  13.9  0.0 36.9  36.9  9.4  9.4   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 13.9 13.9  13.9  0.0 36.9  36.9  9.4  9.4   0.0
DesignQueue:   0    0     0    1   31     4    0    5     6    1    5     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                               PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #30 Center Street / NB Shattuck Avenue
********************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.551
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       9.5
Optimal Cycle:       65              Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   40   40    40    0    0     0   17   17     0    0   17    17
Lanes:       0  1  1  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 6 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     50  982    86    0    0     0   81   55     0    0  139    58
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  50  982    86    0    0     0   81   55     0    0  139    58
Added Vol:     0  118     0    0    0     0    0    0     0    0    0     0
Future:       30  110    30    0    0     0   30   40     0    0   40    60
Initial Fut:  80 1210   116    0    0     0  111   95     0    0  179   118
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   80 1210   116    0    0     0  111   95     0    0  179   118
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  80 1210   116    0    0     0  111   95     0    0  179   118
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   80 1210   116    0    0     0  111   95     0    0  179   118
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.80 0.80  0.80 1.00 1.00  1.00 0.74 0.74  1.00 1.00 0.85  0.85
Lanes:       0.17 2.58  0.25 0.00 0.00  0.00 0.54 0.46  0.00 0.00 0.60  0.40
Final Sat.:  259 3922   376    0    0     0  754  645     0    0  975   643
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.31 0.31  0.31 0.00 0.00  0.00 0.15 0.15  0.00 0.00 0.18  0.18
Crit Moves:       ****                                              ****
Green/Cycle: 0.53 0.53  0.53 0.00 0.00  0.00 0.29 0.29  0.00 0.00 0.29  0.29
Volume/Cap:  0.58 0.58  0.58 0.00 0.00  0.00 0.50 0.50  0.00 0.00 0.63  0.63
Delay/Veh:    3.8  3.8   3.8  0.0  0.0   0.0 20.2 20.2   0.0  0.0 29.1  29.1
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   3.8  3.8   3.8  0.0  0.0   0.0 20.2 20.2   0.0  0.0 29.1  29.1
DesignQueue:   2   25     2    0    0     0    3    3     0    0    5     4
********************************************************************************
```

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #31 Center Street / Oxford Street

Cycle (sec): 75 Critical Vol./Cap. (X): 0.550
Loss Time (sec): 8 (Y+R = 4 sec) Average Delay (sec/veh): 10.5
Optimal Cycle: 46 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	19	19	19	19	19	19	19	19	19	19	19	19
Lanes:	1 0 1 1 0			1 0 1 1 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 13 Nov 2000 << 4:00 - 6:00 PM												
Base Vol:	87	998	24	19	980	67	33	6	84	37	9	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	87	998	24	19	980	67	33	6	84	37	9	16
Added Vol:	0	156	0	-1	85	3	0	0	0	-2	-3	-5
Future:	40	150	10	0	150	30	30	0	30	0	0	0
Initial Fut:	127	1304	34	18	1215	100	63	6	114	35	6	11
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	127	1304	34	18	1215	100	63	6	114	35	6	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	127	1304	34	18	1215	100	63	6	114	35	6	11
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	127	1304	34	18	1215	100	63	6	114	35	6	11
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.19	0.95	0.95	0.18	0.94	0.94	0.81	0.81	0.81	0.76	0.76	0.76
Lanes:	1.00	1.95	0.05	1.00	1.85	0.15	0.34	0.03	0.63	0.67	0.12	0.21
Final Sat.:	359	3504	91	348	3299	272	527	50	954	977	168	307
Capacity Analysis Module:												
Vol/Sat:	0.35	0.37	0.37	0.05	0.37	0.37	0.12	0.12	0.12	0.04	0.04	0.04
Crit Moves:		****						****				
Green/Cycle:	0.64	0.64	0.64	0.64	0.64	0.64	0.25	0.25	0.25	0.25	0.25	0.25
Volume/Cap:	0.55	0.58	0.58	0.08	0.58	0.58	0.47	0.47	0.47	0.14	0.14	0.14
Delay/Veh:	16.8	8.8	8.8	5.8	8.8	8.8	27.8	27.8	27.8	22.5	22.5	22.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	16.8	8.8	8.8	5.8	8.8	8.8	27.8	27.8	27.8	22.5	22.5	22.5
DesignQueue:	2	22	1	0	20	2	2	0	4	1	0	0

365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
PM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Future Volume Alternative)

Intersection #32 Stadium Rim Road / Gayley Road

Cycle (sec): 100 Critical Vol./Cap. (X): 1.299
Loss Time (sec): 0 (Y+R = 4 sec) Average Delay (sec/veh): 98.7
Optimal Cycle: 0 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 0 1 0			0 1 0 0 0			0 0 1! 0 0			0 0 1! 0 0		
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM												
Base Vol:	0	359	19	135	459	0	20	7	15	47	0	232
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	359	19	135	459	0	20	7	15	47	0	232
Added Vol:	0	58	22	6	33	0	0	0	0	40	0	44
Future:	0	99	11	22	55	0	0	0	0	11	0	33
Initial Fut:	0	516	52	163	547	0	20	7	15	98	0	309
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	516	52	163	547	0	20	7	15	98	0	309
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	516	52	163	547	0	20	7	15	98	0	309
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	516	52	163	547	0	20	7	15	98	0	309
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.91	0.09	0.23	0.77	0.00	0.47	0.17	0.36	0.24	0.00	0.76
Final Sat.:	0	504	51	126	421	0	191	67	143	130	0	409
Capacity Analysis Module:												
Vol/Sat:	xxxx	1.02	1.02	1.30	1.30	xxxx	0.10	0.10	0.10	0.76	xxxx	0.76
Crit Moves:		****			****		****			****		
Delay/Veh:	0.0	69.5	69.5	168.2	168	0.0	12.4	12.4	12.4	27.3	0.0	27.3
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	69.5	69.5	168.2	168	0.0	12.4	12.4	12.4	27.3	0.0	27.3
LOS by Move:	*	F	F	F	F	*	B	B	B	D	*	D
ApproachDel:		69.5			168.2			12.4			27.3	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		69.5			168.2			12.4			27.3	
LOS by Appr:		F			F			B			D	

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------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
******************************************************************************
Intersection #33 Allston Way / Oxford Street
******************************************************************************
Average Delay (sec/veh):      2.8          Worst Case Level Of Service:       E
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  1  1  0  0   0  1  0  1  0   1  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      46 1002     0    26 1082    75    23     0   110     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   46 1002     0    26 1082    75    23     0   110     0     0     0
Added Vol:      0  156     0     0   83     0     0     0     0     0     0     0
Future:         0  190     0    10  160    10     0     0    30     0     0     0
Initial Fut:   46 1348     0    36 1325    85    23     0   140     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    46 1348     0    36 1325    85    23     0   140     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Final Vol.:    46 1348     0    36 1325    85    23     0   140     0     0     0
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   6.8 xxxx   6.9 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5 xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1296 xxxx xxxxx  1348 xxxx xxxxx  2147 xxxx   549  xxxx xxxx xxxxx
Potent Cap.:  511 xxxx xxxxx   517 xxxx xxxxx    40 xxxx   457  xxxx xxxx xxxxx
Move Cap.:    511 xxxx xxxxx   517 xxxx xxxxx    35 xxxx   457  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 12.7 xxxx xxxxx  12.5 xxxx xxxxx 219.9 xxxx  16.3 xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     F    *     C     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 12.7 xxxx xxxxx  12.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *     *     *
ApproachDel:     xxxxxx           xxxxxx             45.0           xxxxxx
ApproachLOS:        *                *                 E                *
```



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------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
******************************************************************************
Intersection #34 Kittridge Street / Oxford Street / Fulton Street
******************************************************************************
Average Delay (sec/veh): OVERFLOW          Worst Case Level Of Service:       F
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  1  0  1  0   0  1  0  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      45  995     0     0 1108    96    51     0    69     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   45  995     0     0 1108    96    51     0    69     0     0     0
Added Vol:      0   94     3     9   74     0     0     3     0    18    26    62
Future:        20  180     0     0  150    30    10     0    20     0     0     0
Initial Fut:   65 1269     3     9 1332   126    61     3    89    18    26    62
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    65 1269     3     9 1332   126    61     3    89    18    26    62
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Final Vol.:    65 1269     3     9 1332   126    61     3    89    18    26    62
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.5  6.5   6.9   7.5  6.5   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1357 xxxx xxxxx  1272 xxxx xxxxx  2136 2795   588  2026 2860   636
Potent Cap.:  487 xxxx xxxxx   553 xxxx xxxxx    27   18   434    33   16   425
Move Cap.:    487 xxxx xxxxx   553 xxxx xxxxx     0   15   434    20   14   425
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 13.5 xxxx xxxxx  11.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    B    *     *     B    *     *     *    *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx   36 xxxxx
Shrd StpDel: 13.5 xxxx xxxxx  11.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx 1122 xxxxx
Shared LOS:     B    *     *     B    *     *     *    *     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           1122.1
ApproachLOS:        *                *                F                F
```

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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #35 Stadium Rim Road / Centennial Drive
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap. (X):        0.657
Loss Time (sec):       0 (Y+R =  4 sec) Average Delay (sec/veh):       13.7
Optimal Cycle:         0              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        0  0  0  1  0   0  1  0  0  0   0  0  0  0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0   99   140  102   57     0    0    0     0  204    0   146
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0   99   140  102   57     0    0    0     0  204    0   146
Added Vol:      0    0     0   28    0     0    0    0     0    0    0    84
Future:         0   22    22   22   11     0    0    0     0   11    0    22
Initial Fut:    0  121   162  152   68     0    0    0     0  215    0   252
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0  121   162  152   68     0    0    0     0  215    0   252
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0  121   162  152   68     0    0    0     0  215    0   252
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:     0  121   162  152   68     0    0    0     0  215    0   252
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.43  0.57 0.69 0.31  0.00 0.00 0.00  0.00 0.46 0.00  0.54
Final Sat.:     0  287   384  417  187     0    0    0     0  327    0   383
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.42  0.42 0.36 0.36  xxxx xxxx xxxx  xxxx 0.66 xxxx  0.66
Crit Moves:             ****      ****                        ****
Delay/Veh:    0.0 11.4  11.4 11.5 11.5   0.0  0.0  0.0   0.0 16.1  0.0  16.1
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 11.4  11.4 11.5 11.5   0.0  0.0  0.0   0.0 16.1  0.0  16.1
LOS by Move:    *    B     B    B    B     *    *    *     *    C    *     C
ApproachDel:       11.4            11.5           xxxxxx            16.1
Delay Adj:         1.00            1.00            xxxxx            1.00
ApprAdjDel:        11.4            11.5           xxxxxx            16.1
LOS by Appr:         B               B               *                C
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #36 Bancroft Way / Shattuck Avenue
********************************************************************************
Cycle (sec):          75              Critical Vol./Cap. (X):        0.847
Loss Time (sec):       8 (Y+R =  5 sec) Average Delay (sec/veh):       22.4
Optimal Cycle:        71              Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18     0    0   18    18    0    0     0   16   16    16
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  1! 0  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      30 1186     0    0  949    23    1    0    38  258   97   111
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   30 1186     0    0  949    23    1    0    38  258   97   111
Added Vol:      0   45     0    0  156     0    0    0     0  110    0    76
Future:        10  150     0    0  290    10    0    0     0   30   20    20
Initial Fut:   40 1381     0    0 1395    33    1    0    38  398  117   207
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    40 1381     0    0 1395    33    1    0    38  398  117   207
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   40 1381     0    0 1395    33    1    0    38  398  117   207
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    40 1381     0    0 1395    33    1    0    38  398  117   207
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.13 0.86  1.00 1.00 0.85  0.85 0.78 1.00  0.78 0.66 0.81  0.81
Lanes:       1.00 2.00  0.00 0.00 1.95  0.05 0.03 0.00  0.97 1.00 0.36  0.64
Final Sat.:   239 3249     0    0 3164    75   38    0  1438 1259  558   988
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17 0.43  0.00 0.00 0.44  0.44 0.03 0.00  0.03 0.32 0.21  0.21
Crit Moves:                       ****                        ****
Green/Cycle: 0.52 0.52  0.00 0.00 0.52  0.52 0.37 0.00  0.37 0.37 0.37  0.37
Volume/Cap:  0.32 0.82  0.00 0.00 0.85  0.85 0.07 0.00  0.07 0.85 0.56  0.56
Delay/Veh:   17.1 19.5   0.0  0.0 20.9  20.9 15.4  0.0  15.4 38.6 22.6  22.6
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  17.1 19.5   0.0  0.0 20.9  20.9 15.4  0.0  15.4 38.6 22.6  22.6
DesignQueue:    1   31     0    0   31     1    0    0     1   11    3     6
********************************************************************************
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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #37 Bancroft Way / Fulton Street
******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.508
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      10.3
Optimal Cycle:       49              Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Ignore
Min. Green:    17   17    0     0   17   17     0    0    0    24   24   24
Lanes:        0  1  1  0  0   0  0  2  1  0   0  0  0  0  0   0  1  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      18  164    0     0 1066  165     0    0    0    12  287  898
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   18  164    0     0 1066  165     0    0    0    12  287  898
Added Vol:      2    0    0     0   85    7     0    0    0    20  146   97
Future:        10   10    0     0  130   20     0    0    0    10   30  170
Initial Fut:   30  174    0     0 1281  192     0    0    0    42  463 1165
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.00
PHF Volume:    30  174    0     0 1281  192     0    0    0    42  463    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   30  174    0     0 1281  192     0    0    0    42  463    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.00
Final Vol.:    30  174    0     0 1281  192     0    0    0    42  463    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.73 0.73 1.00  1.00 0.89 0.89  1.00 1.00 1.00  0.81 0.81 1.00
Lanes:       0.29 1.71 0.00  0.00 2.61 0.39  0.00 0.00 0.00  0.17 1.83 1.00
Final Sat.:   408 2365    0     0 4425  663     0    0    0   255 2813 1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.07 0.00  0.00 0.29 0.29  0.00 0.00 0.00  0.16 0.16 0.00
Crit Moves:                       ****                             ****
Green/Cycle: 0.57 0.57 0.00  0.00 0.57 0.57  0.00 0.00 0.00  0.32 0.32 0.00
Volume/Cap:  0.13 0.13 0.00  0.00 0.51 0.51  0.00 0.00 0.00  0.51 0.51 0.00
Delay/Veh:    5.0  5.0  0.0   0.0  6.9  6.9   0.0  0.0  0.0  22.4 22.4  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   5.0  5.0  0.0   0.0  6.9  6.9   0.0  0.0  0.0  22.4 22.4  0.0
DesignQueue:    1    3    0     0   25    4     0    0    0     1   14    0
******************************************************************************
```



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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
         2000 HCM Unsignalized Method (Future Volume Alternative)
******************************************************************************
Intersection #38 Bancroft Way / Ellsworth Street
******************************************************************************
Average Delay (sec/veh):     10.1         Worst Case Level Of Service:      E
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign      Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        1  1  0  0  0   0  0  0  0  1   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     348   11    0     0    0  100     0    0    0     0  877    6
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  348   11    0     0    0  100     0    0    0     0  877    6
Added Vol:     12    0    0     0    0    0     0    0    0     0  160    0
Future:        50    0    0     0    0    0     0    0    0     0  230    0
Initial Fut:  410   11    0     0    0  100     0    0    0     0 1267    6
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   410   11    0     0    0  100     0    0    0     0 1267    6
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Final Vol.:   410   11    0     0    0  100     0    0    0     0 1267    6
Critical Gap Module:
Critical Gp:  7.1  6.5 xxxxx xxxxx xxxx  6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5  4.0 xxxxx xxxxx xxxx  3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  634 1273 xxxxx  xxxx xxxx  637  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  395  169 xxxxx  xxxx xxxx  481  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    313  169 xxxxx  xxxx xxxx  481  xxxx xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 35.9 xxxx xxxxx xxxxx xxxx  14.4 xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    E    *    *     *    *    B     *    *    *     *    *    *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.:  300 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel: 42.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     E    *    *     *    *    *     *    *    *     *    *    *
ApproachDel:      39.4             14.4           xxxxxx           xxxxxx
ApproachLOS:        E                B                *                *
```

```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #39 Bancroft Way / Dana Street
********************************************************************************
Average Delay (sec/veh):      0.0          Worst Case Level Of Service:        A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  1  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:        0    0     0     0    0     0     0    0     0   282  873     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0    0     0     0    0     0     0    0     0   282  873     0
Added Vol:       0    0     0     0    0     0     0    0     0    32  160     0
Future:          0    0     0     0    0     0     0    0     0    50  230     0
Initial Fut:     0    0     0     0    0     0     0    0     0   364 1263     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:      0    0     0     0    0     0     0    0     0   364 1263     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:      0    0     0     0    0     0     0    0     0   364 1263     0
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx     0 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:        *                *                *                *
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #40 Bancroft Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         70                Critical Vol./Cap. (X):        0.414
Loss Time (sec):      8 (Y+R = 22 sec) Average Delay (sec/veh):        19.3
Optimal Cycle:       58                Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     29    0     0     0    0     0     0    0     0     0   21     0
Lanes:        2  0  0  0  0    0  0  0  0  0    0  0  0  0  0    0  0  3  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      495    0     0     0    0     0     0    0     0     0  675     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   495    0     0     0    0     0     0    0     0     0  675     0
Added Vol:       3    0     0     0    0     0     0    0     0     0  159     0
Future:        130    0     0     0    0     0     0    0     0     0  140     0
Initial Fut:   628    0     0     0    0     0     0    0     0     0  974     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    628    0     0     0    0     0     0    0     0     0  974     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   628    0     0     0    0     0     0    0     0     0  974     0
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    628    0     0     0    0     0     0    0     0     0  974     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.92 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.91  1.00
Lanes:        2.00 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 3.00  0.00
Final Sat.:   3502    0     0     0    0     0     0    0     0     0 5187     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.18 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.19  0.00
Crit Moves:   ****                                                    ****
Green/Cycle:  0.42 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.30  0.00
Volume/Cap:   0.43 0.00  0.00  0.00 0.00  0.00  0.00 0.00  0.00  0.00 0.63  0.00
Delay/Veh:    13.6  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 23.0   0.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   13.6  0.0   0.0   0.0  0.0   0.0   0.0  0.0   0.0   0.0 23.0   0.0
DesignQueue:    15    0     0     0    0     0     0    0     0     0   28     0
********************************************************************************
```

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------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
******************************************************************************
Intersection #41 Bancroft Way / Bowditch Street
******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.671
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       16.2
Optimal Cycle:        0              Level Of Service:                  C
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     191    0     0    0    0     0    0    0     0   99  494     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  191    0     0    0    0     0    0    0     0   99  494     0
Added Vol:      0    0     0    0    0     0    0    0     0   27  159     0
Future:        30    0     0    0    0     0    0    0     0   20  110     0
Initial Fut:  221    0     0    0    0     0    0    0     0  146  763     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   221    0     0    0    0     0    0    0     0  146  763     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  221    0     0    0    0     0    0    0     0  146  763     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   221    0     0    0    0     0    0    0     0  146  763     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 0.00  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.32 1.68  0.00
Final Sat.:   617    0     0    0    0     0    0    0     0  218 1158     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.36 xxxx  xxxx xxxx xxxx  xxxx xxxx xxxx  xxxx 0.67 0.66  xxxx
Crit Moves:  ****                                            ****
Delay/Veh:   11.7  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0 17.9 17.2   0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  11.7  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0 17.9 17.2   0.0
LOS by Move:    B    *     *    *    *     *    *    *     *    C    C     *
ApproachDel:      11.7            xxxxxx           xxxxxx            17.3
Delay Adj:        1.00             xxxxx            xxxxx            1.00
ApprAdjDel:       11.7            xxxxxx           xxxxxx            17.3
LOS by Appr:        B                *                *                C
******************************************************************************
```



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------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
******************************************************************************
Intersection #42 Bancroft Way / College Avenue
******************************************************************************
Cycle (sec):        100              Critical Vol./Cap. (X):        0.719
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       16.0
Optimal Cycle:        0              Level Of Service:                  C
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  0  0  0   0  0  0  0  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     371    0     0    0    0     0    0    0     0   83  226     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  371    0     0    0    0     0    0    0     0   83  226     0
Added Vol:     20    0     0    0    0     0    0    0     0   30   44     0
Future:       110    0     0    0    0     0    0    0     0    0   22     0
Initial Fut:  501    0     0    0    0     0    0    0     0  113  292     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   501    0     0    0    0     0    0    0     0  113  292     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  501    0     0    0    0     0    0    0     0  113  292     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   501    0     0    0    0     0    0    0     0  113  292     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 0.00  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.56 1.44  0.00
Final Sat.:   696    0     0    0    0     0    0    0     0  321  856     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.72 xxxx  xxxx xxxx xxxx  xxxx xxxx xxxx  xxxx 0.35 0.34  xxxx
Crit Moves:  ****                                            ****
Delay/Veh:   19.6  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0 11.8 11.4   0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  19.6  0.0   0.0  0.0  0.0   0.0  0.0  0.0   0.0 11.8 11.4   0.0
LOS by Move:    C    *     *    *    *     *    *    *     *    B    B     *
ApproachDel:      19.6            xxxxxx           xxxxxx            11.5
Delay Adj:        1.00             xxxxx            xxxxx            1.00
ApprAdjDel:       19.6            xxxxxx           xxxxxx            11.5
LOS by Appr:        C                *                *                B
******************************************************************************
```

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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #43 Bancroft Way / Piedmont Avenue
********************************************************************************
Cycle (sec):        100             Critical Vol./Cap. (X):        1.004
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):      41.3
Optimal Cycle:        0             Level Of Service:                  E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 13 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     152  439    0    0  357  159    0    0    0    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  152  439    0    0  357  159    0    0    0    0    0    0
Added Vol:     13   70    0    0   43   61    0    0    0    0    0    0
Future:        11   99    0    0   44   11    0    0    0    0    0    0
Initial Fut:  176  608    0    0  444  231    0    0    0    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   176  608    0    0  444  231    0    0    0    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  176  608    0    0  444  231    0    0    0    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:   176  608    0    0  444  231    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       0.22 0.78 0.00 0.00 0.66 0.34 0.00 0.00 0.00 0.00 0.00 0.00
Final Sat.:   175  606    0    0  528  275    0    0    0    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     1.00 1.00 xxxx xxxx 0.84 0.84 xxxx xxxx xxxx xxxx xxxx xxxx
Crit Moves:       ****                 ****
Delay/Veh:   54.2 54.2  0.0  0.0 26.3 26.3  0.0  0.0  0.0  0.0  0.0  0.0
Delay Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  54.2 54.2  0.0  0.0 26.3 26.3  0.0  0.0  0.0  0.0  0.0  0.0
LOS by Move:    F    F    *    *    D    D    *    *    *    *    *    *
ApproachDel:      54.2             26.3           xxxxxx           xxxxxx
Delay Adj:        1.00             1.00            xxxxx            xxxxx
ApprAdjDel:       54.2             26.3           xxxxxx           xxxxxx
LOS by Appr:        F                D                *                *
********************************************************************************
```



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--------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #44 Durant Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):         75             Critical Vol./Cap. (X):        0.816
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):      23.7
Optimal Cycle:       73             Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    19   19   19   19   19   19    0    0    0    0    0    0
Lanes:        1  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      69 1216  120   88 1099   51    9   72   55    0    0    0
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   69 1216  120   88 1099   51    9   72   55    0    0    0
Added Vol:      0   45   13   15  252    0    0    0    0    0    0    0
Future:        11  187   66   66  286   11    0   44   11    0    0    0
Initial Fut:   80 1448  199  169 1637   62    9  116   66    0    0    0
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    80 1448  199  169 1637   62    9  116   66    0    0    0
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   80 1448  199  169 1637   62    9  116   66    0    0    0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Vol.:    80 1448  199  169 1637   62    9  116   66    0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment:  0.13 0.84 0.84 0.86 0.85 0.85 0.77 0.77 0.77 1.00 1.00 1.00
Lanes:       1.00 1.76 0.24 1.00 1.93 0.07 0.09 1.22 0.69 0.00 0.00 0.00
Final Sat.:   243 2805  385 1625 3115  118  138 1773 1009    0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.33 0.52 0.52 0.10 0.53 0.53 0.07 0.07 0.07 0.00 0.00 0.00
Crit Moves:       ****      ****                     ****
Green/Cycle: 0.49 0.49 0.49 0.64 0.64 0.64 0.20 0.20 0.20 0.00 0.00 0.00
Volume/Cap:  0.67 1.05 1.05 0.16 0.82 0.82 0.33 0.33 0.33 0.00 0.00 0.00
Delay/Veh:   31.6 45.2 45.2  5.8  3.8  3.8 27.2 27.2 27.2  0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  31.6 45.2 45.2  5.8  3.8  3.8 27.2 27.2 27.2  0.0  0.0  0.0
DesignQueue:    2   35    5    3   28    1    0    4    2    0    0    0
********************************************************************************
```

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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #45 Durant Avenue / Fulton Street
*******************************************************************************
Cycle (sec):         75              Critical Vol./Cap. (X):        0.454
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        9.9
Optimal Cycle:       51              Level Of Service:                 A
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    21   21     0    22   22    22     0    0     0
Lanes:        0  0  0  0  0   1  1  1  0  0   1  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0     0   527  760     0   137  219    33     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0    0     0   527  760     0   137  219    33     0    0     0
Added Vol:     0    0     0    86   20     0     2   27     0     0    0     0
Future:        0    0     0    70   90     0    20  110    30     0    0     0
Initial Fut:   0    0     0   683  870     0   159  356    63     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0    0     0   683  870     0   159  356    63     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0    0     0   683  870     0   159  356    63     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0    0     0   683  870     0   159  356    63     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  0.95 0.95  1.00  0.98 0.93  0.93  1.00 1.00  1.00
Lanes:       0.00 0.00  0.00  1.32 1.68  0.00  1.00 1.70  0.30  0.00 0.00  0.00
Final Sat.:    0    0     0  2381 3034     0  1858 3000   531     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.29 0.29  0.00  0.09 0.12  0.12  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.00 0.00  0.00  0.60 0.60  0.00  0.29 0.29  0.29  0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.00  0.48 0.48  0.00  0.29 0.40  0.40  0.00 0.00  0.00
Delay/Veh:    0.0  0.0   0.0   5.3  5.3   0.0  21.8 22.4  22.4   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0   5.3  5.3   0.0  21.8 22.4  22.4   0.0  0.0   0.0
DesignQueue:   0    0     0    12   16     0     5   11     2     0    0     0
*******************************************************************************
```



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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #46 Durant Avenue / Telegraph Avenue
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.460
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       13.3
Optimal Cycle:       43              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   18    18     0    0     0    17   17     0     0    0     0
Lanes:        0  0  1  1  0   0  0  0  0  0   0  1  2  0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  362   119     0    0     0   202  690     0     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  362   119     0    0     0   202  690     0     0    0     0
Added Vol:     0    1     7     0    0     0     2  100     0     0    0     0
Future:        0  110    30     0    0     0    20  160     0     0    0     0
Initial Fut:   0  473   156     0    0     0   224  950     0     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    0  473   156     0    0     0   224  950     0     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  473   156     0    0     0   224  950     0     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    0  473   156     0    0     0   224  950     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.91  0.91  1.00 1.00  1.00  0.91 0.91  1.00  1.00 1.00  1.00
Lanes:       0.00 1.50  0.50  0.00 0.00  0.00  0.57 2.43  0.00  0.00 0.00  0.00
Final Sat.:    0 2614   862     0    0     0   990 4197     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.18  0.00 0.00  0.00  0.23 0.23  0.00  0.00 0.00  0.00
Crit Moves:       ****                               ****
Green/Cycle: 0.00 0.39  0.39  0.00 0.00  0.00  0.49 0.49  0.00  0.00 0.00  0.00
Volume/Cap:  0.00 0.46  0.46  0.00 0.00  0.00  0.46 0.46  0.00  0.00 0.00  0.00
Delay/Veh:    0.0 15.3  15.3   0.0  0.0   0.0  12.3 12.3   0.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 15.3  15.3   0.0  0.0   0.0  12.3 12.3   0.0   0.0  0.0   0.0
DesignQueue:   0   12     4     0    0     0     5   20     0     0    0     0
*******************************************************************************
```

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---------------------------------------------------------------------------------
                               365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                   PM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*********************************************************************************
Intersection #47 Durant Avenue / College Avenue
*********************************************************************************
Cycle (sec):          70                 Critical Vol./Cap. (X):        0.436
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        13.7
Optimal Cycle:        42                 Level Of Service:                 B
*********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted         Permitted         Permitted         Permitted
Rights:           Include           Include           Include           Include
Min. Green:     0   18    18     0    0     0    16   16    16     0    0     0
Lanes:        0  0  0  1  0    0  1  0  0  0    1  0  1  1  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  189    62    16   56     0   127  268   202     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  189    62    16   56     0   127  268   202     0    0     0
Added Vol:      0    4     7     0   30     0    16   96    18     0    0     0
Future:         0   44    22     0    0     0    66   77    44     0    0     0
Initial Fut:    0  237    91    16   86     0   209  441   264     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  237    91    16   86     0   209  441   264     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  237    91    16   86     0   209  441   264     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  237    91    16   86     0   209  441   264     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.96  0.96  0.94 0.94  1.00  0.94 0.90  0.90  1.00 1.00  1.00
Lanes:       0.00 0.72  0.28  0.16 0.84  0.00  1.00 1.25  0.75  0.00 0.00  0.00
Final Sat.:     0 1322   508   280 1503     0  1794 2132  1276     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.18  0.18  0.06 0.06  0.00  0.12 0.21  0.21  0.00 0.00  0.00
Crit Moves:       ****                              ****
Green/Cycle: 0.00 0.41  0.41  0.41 0.41  0.00  0.47 0.47  0.47  0.00 0.00  0.00
Volume/Cap:  0.00 0.44  0.44  0.14 0.14  0.00  0.25 0.44  0.44  0.00 0.00  0.00
Delay/Veh:    0.0 16.6  16.6  13.3 13.3   0.0  11.6 13.0  13.0   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 16.6  16.6  13.3 13.3   0.0  11.6 13.0  13.0   0.0  0.0   0.0
DesignQueue:    0    6     2     0    2     0     4    9     6     0    0     0
*********************************************************************************
```



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---------------------------------------------------------------------------------
                               365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                   PM Peak Hour
---------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM 4-Way Stop Method (Future Volume Alternative)
*********************************************************************************
Intersection #48 Durant Avenue / Piedmont Avenue
*********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap. (X):        0.944
Loss Time (sec):       0 (Y+R =  4 sec) Average Delay (sec/veh):        37.7
Optimal Cycle:         0                 Level Of Service:                 E
*********************************************************************************
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Stop Sign         Stop Sign         Stop Sign         Stop Sign
Rights:           Include           Include           Include           Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  1  0  0    0  0  1  0  0    1  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  398     0     0  427     0   179    0   197     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  398     0     0  427     0   179    0   197     0    0     0
Added Vol:      0   59     0     0   43     0    24    0    79     0    0     0
Future:         0   77     0     0   55     0    44    0    44     0    0     0
Initial Fut:    0  534     0     0  525     0   247    0   320     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  534     0     0  525     0   247    0   320     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  534     0     0  525     0   247    0   320     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  534     0     0  525     0   247    0   320     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 1.00  0.00  0.00 1.00  0.00  1.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:     0  566     0     0  564     0   460    0   541     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx 0.94  xxxx  xxxx 0.93  xxxx  0.54 xxxx  0.59  xxxx xxxx  xxxx
Crit Moves:       ****             ****                   ****
Delay/Veh:    0.0 49.5   0.0   0.0 47.0   0.0  18.7  0.0  17.8   0.0  0.0   0.0
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 49.5   0.0   0.0 47.0   0.0  18.7  0.0  17.8   0.0  0.0   0.0
LOS by Move:    *    E     *     *    E     *     C    *     C     *    *     *
ApproachDel:       49.5              47.0              18.2            xxxxxx
Delay Adj:         1.00              1.00              1.00             xxxxx
ApprAdjDel:        49.5              47.0              18.2            xxxxxx
LOS by Appr:         E                 E                 C                 *
*********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #49 Channing Way / Shattuck Avenue
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.800
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        9.3
Optimal Cycle:       60               Level Of Service:                  A
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16    16   16   16    16   22   22    22   22   22    22
Lanes:       1  0  1  1  0   1  0  1  1  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     83 1279    94   19 1089    49   18   76    81  144   97   106
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  83 1279    94   19 1089    49   18   76    81  144   97   106
Added Vol:     0   33     6    0  252     0    0    0     0   24    0    26
Future:       10  180    20   50  110    90   30   80    20   30   20    30
Initial Fut:  93 1492   120   69 1451   139   48  156   101  198  117   162
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   93 1492   120   69 1451   139   48  156   101  198  117   162
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  93 1492   120   69 1451   139   48  156   101  198  117   162
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   93 1492   120   69 1451   139   48  156   101  198  117   162
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.94  0.94 0.09 0.94  0.94 0.96 0.96  0.96 0.95 0.95  0.95
Lanes:       1.00 1.85  0.15 1.00 1.83  0.17 0.16 0.51  0.33 0.41 0.25  0.34
Final Sat.:  1900 3305   266  171 3252   311  286  928   601  752  445   616
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.45  0.45 0.40 0.45  0.45 0.17 0.17  0.17 0.26 0.26  0.26
Crit Moves:       ****                                             ****
Green/Cycle: 0.56 0.56  0.56 0.59 0.59  0.59 0.33 0.33  0.33 0.33 0.33  0.33
Volume/Cap:  0.09 0.80  0.80 0.68 0.75  0.75 0.51 0.51  0.51 0.80 0.80  0.80
Delay/Veh:    1.2  5.2   5.2 31.3  2.8   2.8 23.4 23.4  23.4 33.7 33.7  33.7
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   1.2  5.2   5.2 31.3  2.8   2.8 23.4 23.4  23.4 33.7 33.7  33.7
DesignQueue:    2   30     2    1   28     3    1    5     3    6    3     5
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
********************************************************************************
Intersection #50 Channing Way / Fulton Street
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap. (X):        0.842
Loss Time (sec):      0 (Y+R =  4 sec) Average Delay (sec/veh):       27.6
Optimal Cycle:        0               Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  0  0  0   0  1  0  1  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0     0   48  686    61    0  133    38   15  257     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0   48  686    61    0  133    38   15  257     0
Added Vol:     0    0     0    4   16     0    0    6     0    0   50     0
Future:        0    0     0   10  100     0    0  110    30   10   70     0
Initial Fut:   0    0     0   62  802    61    0  249    68   25  377     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0     0   62  802    61    0  249    68   25  377     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0   62  802    61    0  249    68   25  377     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0     0   62  802    61    0  249    68   25  377     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 0.13 1.74  0.13 0.00 0.79  0.21 0.06 0.94  0.00
Final Sat.:    0    0     0   74  964    74    0  439   120   35  528     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx  xxxx 0.84 0.83  0.82 xxxx 0.57  0.57 0.71 0.71  xxxx
Crit Moves:                  ****                  ****             ****
Delay/Veh:    0.0  0.0   0.0 34.6 33.2  31.8  0.0 17.0  17.0 23.0 23.0   0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   0.0 34.6 33.2  31.8  0.0 17.0  17.0 23.0 23.0   0.0
LOS by Move:   *    *     *    D    D     D    *    C     C    C    C     *
ApproachDel:    xxxxxx           33.2             17.0             23.0
Delay Adj:       xxxxx           1.00             1.00             1.00
ApprAdjDel:     xxxxxx           33.2             17.0             23.0
LOS by Appr:       *               D                C                C
********************************************************************************
```

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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #51 Channing Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):     OVERFLOW
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      16.4
Optimal Cycle:      180              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18     0    0     0    17   17     0     0   17    17
Lanes:        0  1  0  1  0   0  0  0  0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 1 Sep 1997 << 4:00 - 6:00 PM
Base Vol:      86  410    41     0    0     0    23  144     0     0  227    46
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   86  410    41     0    0     0    23  144     0     0  227    46
Added Vol:      0    4     9     0    0     0     0   14     0     0   50     4
Future:        10   40    30     0    0     0     0   30    80    40   30     0
Initial Fut:   96  454    80     0    0     0    23  188    80    40  307    50
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    96  454    80     0    0     0    23  188    80    40  307    50
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   96  454    80     0    0     0    23  188    80    40  307    50
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    96  454    80     0    0     0    23  188    80    40  307    50
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.91 0.91  0.91  1.00 1.00  1.00  0.95 0.95  0.96  0.74 0.98  0.98
Lanes:       0.30 1.45  0.25  0.00 0.00  0.00  0.11 0.89  0.00  0.00 0.86  0.14
Final Sat.:   529 2504   441     0    0     0   196 1603     0     0 1606   262
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.18  0.18  0.00 0.00  0.00  0.12 0.12  xxxx  xxxx 0.19  0.19
Crit Moves:       ****                                          ****
Green/Cycle: 0.26 0.26  0.26  0.00 0.00  0.00  0.63 0.63  0.63  0.63 0.63  0.63
Volume/Cap:  0.71 0.71  0.71  0.00 0.00  0.00  0.19 0.19  xxxx  xxxx 0.30  0.30
Delay/Veh:   28.7 28.7  28.7   0.0  0.0   0.0   5.8  5.8   0.0   0.0  6.6   6.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  28.7 28.7  28.7   0.0  0.0   0.0   5.8  5.8   0.0   0.0  6.6   6.6
DesignQueue:    3   14     2     0    0     0     0    3     0     0    5     1
********************************************************************************
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--------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #52 Channing Way / College Avenue
********************************************************************************
Cycle (sec):         65              Critical Vol./Cap. (X):        0.619
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      16.0
Optimal Cycle:       43              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    18   18    18    18   18    18    17   17    17    17   17    17
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      31  189    41     7  206    24     5   95    58   124  141    47
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   31  189    41     7  206    24     5   95    58   124  141    47
Added Vol:      3   11    -1     0   48     0     0   78    20    -2   14     0
Future:        30   60    30     0   40    10    30   40    40    40   20    30
Initial Fut:   64  260    70     7  294    34    35  213   118   162  175    77
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    64  260    70     7  294    34    35  213   118   162  175    77
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   64  260    70     7  294    34    35  213   118   162  175    77
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    64  260    70     7  294    34    35  213   118   162  175    77
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.87 0.87  0.87  0.98 0.98  0.98  0.90 0.90  0.90  0.71 0.71  0.71
Lanes:       0.16 0.66  0.18  0.02 0.88  0.10  0.10 0.58  0.32  0.39 0.42  0.19
Final Sat.:   270 1095   295    39 1631   189   164  996   552   530  572   252
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.24  0.24  0.18 0.18  0.18  0.21 0.21  0.21  0.31 0.31  0.31
Crit Moves:       ****                                               ****
Green/Cycle: 0.38 0.38  0.38  0.38 0.38  0.38  0.49 0.49  0.49  0.49 0.49  0.49
Volume/Cap:  0.62 0.62  0.62  0.47 0.47  0.47  0.43 0.43  0.43  0.62 0.62  0.62
Delay/Veh:   19.3 19.3  19.3  16.0 16.0  16.0  12.2 12.2  12.2  16.3 16.3  16.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  19.3 19.3  19.3  16.0 16.0  16.0  12.2 12.2  12.2  16.3 16.3  16.3
DesignQueue:    2    6     2     0    7     1     1    4     2     3    3     1
********************************************************************************
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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #53 Haste Street / Shattuck Avenue
********************************************************************************
Cycle (sec):          75              Critical Vol./Cap. (X):        1.125
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       19.6
Optimal Cycle:       180              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    22   22    0     0   22   22     0    0    0    27   27   27
Lanes:        1  0  2  0  0   0  0  1  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     104 1277    0     0 1208   88     0    0    0   268  336  152
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  104 1277    0     0 1208   88     0    0    0   268  336  152
Added Vol:      0   38    0     0  231   45     0    0    0    32   73    0
Future:        30  160    0     0  130   20     0    0    0    40   80   40
Initial Fut:  134 1475    0     0 1569  153     0    0    0   340  489  192
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   134 1475    0     0 1569  153     0    0    0   340  489  192
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  134 1475    0     0 1569  153     0    0    0   340  489  192
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:   134 1475    0     0 1569  153     0    0    0   340  489  192
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.10 0.95 1.00  1.00 0.94 0.94  1.00 1.00 1.00  0.90 0.90 0.90
Lanes:       1.00 2.00 0.00  0.00 1.82 0.18  0.00 0.00 0.00  0.66 0.96 0.38
Final Sat.:   190 3610    0     0 3246  317     0    0    0  1136 1634  641
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.71 0.41 0.00  0.00 0.48 0.48  0.00 0.00 0.00  0.30 0.30 0.30
Crit Moves:  ****                                                  ****
Green/Cycle: 0.53 0.53 0.00  0.00 0.53 0.53  0.00 0.00 0.00  0.36 0.36 0.36
Volume/Cap:  1.32 0.77 0.00  0.00 0.91 0.91  0.00 0.00 0.00  0.83 0.83 0.83
Delay/Veh:  202.5  6.3  0.0   0.0 11.5 11.5   0.0  0.0  0.0  28.6 28.6 28.6
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh: 202.5  6.3  0.0   0.0 11.5 11.5   0.0  0.0  0.0  28.6 28.6 28.6
DesignQueue:    3   32    0     0   35    3     0    0    0    10   14    6
********************************************************************************
```



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--------------------------------------------------------------------------------
                            365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #54 Haste Street / Fulton Street
********************************************************************************
Cycle (sec):          80              Critical Vol./Cap. (X):        0.549
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):       22.7
Optimal Cycle:        53              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:     0    0    0     0   25   25     0    0    0    20   20    0
Lanes:        0  0  0  0  0   0  0  1  1  0   0  0  0  0  0   0  1  1  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0    0     0  580  154     0    0    0    50  604    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0    0    0     0  580  154     0    0    0    50  604    0
Added Vol:      0    0    0     0   12    5     0    0    0     0  100    0
Future:         0    0    0     0   70   80     0    0    0    30   60    0
Initial Fut:    0    0    0     0  662  239     0    0    0    80  764    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:     0    0    0     0  662  239     0    0    0    80  764    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0    0    0     0  662  239     0    0    0    80  764    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:     0    0    0     0  662  239     0    0    0    80  764    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  1.00 1.00 1.00  1.00 0.91 0.91  1.00 1.00 1.00  0.95 0.95 1.00
Lanes:       0.00 0.00 0.00  0.00 1.47 0.53  0.00 0.00 0.00  0.19 1.81 0.00
Final Sat.:     0    0    0     0 2546  919     0    0    0   342 3268    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00  0.00 0.26 0.26  0.00 0.00 0.00  0.23 0.23 0.00
Crit Moves:                       ****                              ****
Green/Cycle: 0.00 0.00 0.00  0.00 0.69 0.69  0.00 0.00 0.00  0.26 0.26 0.00
Volume/Cap:  0.00 0.00 0.00  0.00 0.38 0.38  0.00 0.00 0.00  0.89 0.89 0.00
Delay/Veh:    0.0  0.0  0.0   0.0  5.7  5.7   0.0  0.0  0.0  40.8 40.8  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   0.0  0.0  0.0   0.0  5.7  5.7   0.0  0.0  0.0  40.8 40.8  0.0
DesignQueue:    0    0    0     0   10    4     0    0    0     3   27    0
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #55 Haste Street / Telegraph Avenue
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.483
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       14.4
Optimal Cycle:       40              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16     0    0    0     0    0    0     0    0   16    16
Lanes:       0  1  1  0  0   0  0  0  0  0   0  0  0  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     186  476     0    0    0     0    0    0     0    0  470    57
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  186  476     0    0    0     0    0    0     0    0  470    57
Added Vol:      0   12     0    0    0     0    0    0     0    0  100     0
Future:        50  100     0    0    0     0    0    0     0    0   50    30
Initial Fut:  236  588     0    0    0     0    0    0     0    0  620    87
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   236  588     0    0    0     0    0    0     0    0  620    87
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  236  588     0    0    0     0    0    0     0    0  620    87
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   236  588     0    0    0     0    0    0     0    0  620    87
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.95  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 0.93  0.93
Lanes:       0.57 1.43  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 1.75  0.25
Final Sat.:  1034 2576     0    0    0     0    0    0     0    0 3109   436
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.23 0.23  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.20  0.20
Crit Moves:       ****                                             ****
Green/Cycle: 0.40 0.40  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.49  0.49
Volume/Cap:  0.57 0.57  0.00 0.00 0.00  0.00 0.00 0.00  0.00 0.00 0.41  0.41
Delay/Veh:   16.2 16.2   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 12.3  12.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  16.2 16.2   0.0  0.0  0.0   0.0  0.0  0.0   0.0  0.0 12.3  12.3
DesignQueue:    6   15     0    0    0     0    0    0     0    0   13     2
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #56 Haste Street / College Avenue
********************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.497
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       11.3
Optimal Cycle:       40              Level Of Service:                 B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   16   16     0    0   16    16    0    0     0   16   16    16
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      88  236     0    0  337    56    0    0     0   90  244    29
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   88  236     0    0  337    56    0    0     0   90  244    29
Added Vol:      2   13     0    0   64     1    0    0     0    0    2     0
Future:        30   70     0    0   80    30    0    0     0   30   30    40
Initial Fut:  120  319     0    0  481    87    0    0     0  120  276    69
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   120  319     0    0  481    87    0    0     0  120  276    69
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  120  319     0    0  481    87    0    0     0  120  276    69
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   120  319     0    0  481    87    0    0     0  120  276    69
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.76 0.76  1.00 1.00 0.98  0.98 1.00 1.00  1.00 0.91 0.91  0.91
Lanes:       0.27 0.73  0.00 0.00 0.85  0.15 0.00 0.00  0.00 0.51 1.19  0.30
Final Sat.:   393 1045     0    0 1575   285    0    0     0  891 2049   512
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.31 0.31  0.00 0.00 0.31  0.31 0.00 0.00  0.00 0.13 0.13  0.13
Crit Moves:                      ****                                ****
Green/Cycle: 0.61 0.61  0.00 0.00 0.61  0.61 0.00 0.00  0.00 0.27 0.27  0.27
Volume/Cap:  0.50 0.50  0.00 0.00 0.50  0.50 0.00 0.00  0.00 0.50 0.50  0.50
Delay/Veh:    6.0  6.0   0.0  0.0  5.6   5.6  0.0  0.0   0.0 23.4 23.4  23.4
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   6.0  6.0   0.0  0.0  5.6   5.6  0.0  0.0   0.0 23.4 23.4  23.4
DesignQueue:    2    5     0    0    8     1    0    0     0    4    8     2
********************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #57 Dwight Way / Martin Luther King Way
********************************************************************************
Cycle (sec):          75              Critical Vol./Cap. (X):        0.993
Loss Time (sec):      12 (Y+R =  4 sec) Average Delay (sec/veh):       28.5
Optimal Cycle:       137              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2002 << 4:00-6:00 PM
Base Vol:      71  821    60   113  860   272    49  444   111     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   71  821    60   113  860   272    49  444   111     0    0     0
Added Vol:     17   13     0     0   15    85     0   14     4     0    0     0
Future:        10  220    10    20   90    10    20   50    10     0    0     0
Initial Fut:   98 1054    70   133  965   367    69  508   125     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    98 1054    70   133  965   367    69  508   125     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   98 1054    70   133  965   367    69  508   125     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    98 1054    70   133  965   367    69  508   125     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.64 0.64  0.64  0.61 0.61  0.61  0.90 0.90  0.90  1.00 1.00  1.00
Lanes:       0.16 1.73  0.11  0.18 1.32  0.50  0.20 1.45  0.35  0.00 0.00  0.00
Final Sat.:   195 2095   139   212 1535   584   336 2473   609     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.50 0.50  0.50  0.63 0.63  0.63  0.21 0.21  0.21  0.00 0.00  0.00
Crit Moves:                        ****              ****
Green/Cycle: 0.63 0.63  0.63  0.63 0.63  0.63  0.21 0.21  0.21  0.00 0.00  0.00
Volume/Cap:  0.79 0.79  0.79  0.99 0.99  0.99  0.99 0.99  0.99  0.00 0.00  0.00
Delay/Veh:    9.3  9.3   9.3  28.5 28.5  28.5  61.9 61.9  61.9   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   9.3  9.3   9.3  28.5 28.5  28.5  61.9 61.9  61.9   0.0  0.0   0.0
DesignQueue:    2   18     1     2   16     6     2   18     4     0    0     0
********************************************************************************
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #58 Dwight Way / Shattuck Avenue
********************************************************************************
Cycle (sec):          75              Critical Vol./Cap. (X):        0.929
Loss Time (sec):      12 (Y+R =  5 sec) Average Delay (sec/veh):       17.0
Optimal Cycle:       104              Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted       Prot+Permit       Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  0  1  1  0   1  0  1  1  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0 1273   123   133 1390     0    77  426   200     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1273   123   133 1390     0    77  426   200     0    0     0
Added Vol:      0   33     0    17  245     0     5   10     0     0    0     0
Future:         0  160    30    10  140     0    10   50    10     0    0     0
Initial Fut:    0 1466   153   160 1775     0    92  486   210     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1466   153   160 1775     0    92  486   210     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1466   153   160 1775     0    92  486   210     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1466   153   160 1775     0    92  486   210     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.94  0.94  0.25 0.95  0.95  0.88 0.88  0.88  1.00 1.00  1.00
Lanes:       0.00 1.81  0.19  1.00 2.00  0.00  0.23 1.24  0.53  0.00 0.00  0.00
Final Sat.:     0 3223   336   468 3610     0   388 2052   887     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.45  0.45  0.34 0.49  0.00  0.24 0.24  0.24  0.00 0.00  0.00
Crit Moves:       ****        ****                   ****
Green/Cycle: 0.00 0.49  0.49  0.59 0.59  0.00  0.26 0.26  0.26  0.00 0.00  0.00
Volume/Cap:  0.00 0.93  0.93  0.58 0.84  0.00  0.93 0.93  0.93  0.00 0.00  0.00
Delay/Veh:    0.0 16.7  16.7  13.6  5.0   0.0  45.1 45.1  45.1   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 16.7  16.7  13.6  5.0   0.0  45.1 45.1  45.1   0.0  0.0   0.0
DesignQueue:    0   35     4     6   35     0     3   16     7     0    0     0
********************************************************************************
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                       365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                             PM Peak Hour
--------------------------------------------------------------------------------
                  Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #59 Dwight Way / Fulton Street
********************************************************************************
Cycle (sec):         75               Critical Vol./Cap. (X):        0.620
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        17.3
Optimal Cycle:       45               Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0    0    21   21    0     0    0   16    16    0    0     0
Lanes:       0  0  0  0  1   2  0  0  0  0   0  0  1  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0    62  631    0     0    0  664    15    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0    62  631    0     0    0  664    15    0    0     0
Added Vol:     0    0     0   12    0     0    0   27     0    0    0     0
Future:        0    0    20  100    0     0    0   60    30    0    0     0
Initial Fut:   0    0    82  743    0     0    0  751    45    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0    0    82  743    0     0    0  751    45    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0    82  743    0     0    0  751    45    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0    0    82  743    0     0    0  751    45    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 1.00  0.87 0.59 1.00  1.00 1.00 0.94  0.94 1.00 1.00  1.00
Lanes:       0.00 0.00  1.00 2.00 0.00  0.00 0.00 1.89  0.11 0.00 0.00  0.00
Final Sat.:    0    0  1644 2245    0     0    0 3375   202    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.05 0.33 0.00  0.00 0.00 0.22  0.22 0.00 0.00  0.00
Crit Moves:                  ****                ****
Green/Cycle: 0.00 0.00  0.53 0.53 0.00  0.00 0.00 0.36  0.36 0.00 0.00  0.00
Volume/Cap:  0.00 0.00  0.09 0.62 0.00  0.00 0.00 0.62  0.62 0.00 0.00  0.00
Delay/Veh:    0.0  0.0   8.8 14.6  0.0   0.0  0.0 20.8  20.8  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  0.0   8.8 14.6  0.0   0.0  0.0 20.8  20.8  0.0  0.0   0.0
DesignQueue:   0    0     2   15    0     0    0   21     1    0    0     0
********************************************************************************
```



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                       365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                             PM Peak Hour
--------------------------------------------------------------------------------
                  Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #60 Dwight Way / Telegraph Avenue
********************************************************************************
Cycle (sec):         70               Critical Vol./Cap. (X):        0.981
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        34.4
Optimal Cycle:      131               Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    0   15    15    0    0     0   17   17    17    0    0     0
Lanes:       0  0  1  1  0   0  0  0  0  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  590   149    0    0     0  130  671   813    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  590   149    0    0     0  130  671   813    0    0     0
Added Vol:     0    4     0    0    0     0    9   30    27    0    0     0
Future:        0  132    11    0    0     0   11   66   110    0    0     0
Initial Fut:   0  726   160    0    0     0  150  767   950    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  726   160    0    0     0  150  767   950    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  726   160    0    0     0  150  767   950    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  726   160    0    0     0  150  767   950    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.92  0.92 1.00 1.00  1.00 0.81 0.81  0.81 1.00 1.00  1.00
Lanes:       0.00 1.64  0.36 0.00 0.00  0.00 0.16 0.84  1.00 0.00 0.00  0.00
Final Sat.:    0 2878   634    0    0     0  252 1289  1541    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.25 0.00 0.00  0.00 0.60 0.60  0.62 0.00 0.00  0.00
Crit Moves:       ****                                  ****
Green/Cycle: 0.00 0.26  0.26 0.00 0.00  0.00 0.63 0.63  0.63 0.00 0.00  0.00
Volume/Cap:  0.00 0.98  0.98 0.00 0.00  0.00 0.95 0.95  0.98 0.00 0.00  0.00
Delay/Veh:    0.0 51.9  51.9  0.0  0.0   0.0 23.0 23.0  29.2  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 51.9  51.9  0.0  0.0   0.0 23.0 23.0  29.2  0.0  0.0   0.0
DesignQueue:   0   22     5    0    0     0    2   13    16    0    0     0
********************************************************************************
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------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #61 Dwight Way / College Avenue
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.624
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       14.5
Optimal Cycle:       39              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   16    16   16   16     0   15   15    15    0    0     0
Lanes:       0  0  0  1  0   0  1  0  0  0   0  1  0  1  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 19 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  294    52   49  374     0   34  483   129    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  294    52   49  374     0   34  483   129    0    0     0
Added Vol:     0   15     0    0   64     0    1   25     4    0    0     0
Future:        0   50    60   20   80     0   30    0    10    0    0     0
Initial Fut:   0  359   112   69  518     0   65  508   143    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  359   112   69  518     0   65  508   143    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  359   112   69  518     0   65  508   143    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  359   112   69  518     0   65  508   143    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.97  0.97 0.90 0.90  1.00 0.89 0.89  0.89 1.00 1.00  1.00
Lanes:       0.00 0.76  0.24 0.12 0.88  0.00 0.18 1.42  0.40 0.00 0.00  0.00
Final Sat.:    0 1402   437  202 1516     0  308 2410   678    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.26  0.26 0.34 0.34  0.00 0.21 0.21  0.21 0.00 0.00  0.00
Crit Moves:                       ****             ****
Green/Cycle: 0.00 0.55  0.55 0.55 0.55  0.00 0.34 0.34  0.34 0.00 0.00  0.00
Volume/Cap:  0.00 0.47  0.47 0.62 0.62  0.00 0.62 0.62  0.62 0.00 0.00  0.00
Delay/Veh:    0.0  8.2   8.2 10.6 10.6   0.0 22.0 22.0  22.0  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  8.2   8.2 10.6 10.6   0.0 22.0 22.0  22.0  0.0  0.0   0.0
DesignQueue:   0    7     2    1   10     0    2   14     4    0    0     0
*******************************************************************************
```



```
------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #62 Dwight Way / Piedmont Avenue / Warring Street
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap. (X):        0.472
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):       13.7
Optimal Cycle:       61              Level Of Service:                 B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0   29    29   29   29     0   24   24    24   24    0    24
Lanes:       0  0  1  1  0   0  1  1  0  0   1  0  1  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0  527     1    8  353     0  132  162   307   53    0   112
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  527     1    8  353     0  132  162   307   53    0   112
Added Vol:     0   28     0    0  155     0    0    0    25    0    0     0
Future:        0   88    22   11   33     0   22   11    44   33    0    11
Initial Fut:   0  643    23   19  541     0  154  173   376   86    0   123
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    0  643    23   19  541     0  154  173   376   86    0   123
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  643    23   19  541     0  154  173   376   86    0   123
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:    0  643    23   19  541     0  154  173   376   86    0   123
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  1.00 0.95  0.95 0.88 0.88  1.00 0.66 1.00  0.85 0.76 1.00  0.76
Lanes:       0.00 1.93  0.07 0.07 1.93  0.00 1.00 1.00  1.00 0.41 0.00  0.59
Final Sat.:    0 3468   124  114 3236     0 1250 1900  1615  594    0   850
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.19  0.19 0.17 0.17  0.00 0.12 0.09  0.23 0.14 0.00  0.14
Crit Moves:       ****                                  ****
Green/Cycle: 0.00 0.41  0.41 0.41 0.41  0.00 0.47 0.47  0.47 0.47 0.00  0.47
Volume/Cap:  0.00 0.45  0.45 0.40 0.40  0.00 0.26 0.19  0.49 0.31 0.00  0.31
Delay/Veh:    0.0 15.0  15.0 14.6 14.6   0.0 11.4 10.9  13.3 11.7  0.0  11.7
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 15.0  15.0 14.6 14.6   0.0 11.4 10.9  13.3 11.7  0.0  11.7
DesignQueue:   0   15     1    0   13     0    3    4     8    2    0     3
*******************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #63 Dwight Avenue / Prospect Street
********************************************************************************
Average Delay (sec/veh):      6.0          Worst Case Level Of Service:       B
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0    0     0    27    0   165   187  128     0     0   93    16
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0    27    0   165   187  128     0     0   93    16
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0    0     0    10    0    20    20   20     0     0   20     0
Initial Fut:    0    0     0    37    0   185   207  148     0     0  113    16
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0    0     0    37    0   185   207  148     0     0  113    16
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0    0     0    37    0   185   207  148     0     0  113    16
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   6.4 xxxx   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   3.5 xxxx   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx   683 xxxx   121   129 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   418 xxxx   936  1469 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   367 xxxx   936  1469 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  744 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 11.9 xxxxx   7.9 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:     xxxxxx            11.9            xxxxxx           xxxxxx
ApproachLOS:        *                B                *                *
```



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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #64 Adeline Street / Ward Avenue / Shattuck Avenue
********************************************************************************
Cycle (sec):          90               Critical Vol./Cap. (X):        1.003
Loss Time (sec):       8 (Y+R =  6 sec) Average Delay (sec/veh):        33.3
Optimal Cycle:       180               Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Permitted
Rights:           Include          Include          Include          Include
Min. Green:     0   25    25     0   25    25    19    0    19     0    0     0
Lanes:        0  0  0  1  0    0  0  2  0  1    2  0  0  0  1    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0  690     5     0  957   825   903    0     2     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  690     5     0  957   825   903    0     2     0    0     0
Added Vol:      0   25     0     0  195    61     8    0     0     0    0     0
Future:         0   50     0     0   50   110   130    0     0     0    0     0
Initial Fut:    0  765     5     0 1202   996  1041    0     2     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  765     5     0 1202   996  1041    0     2     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  765     5     0 1202   996  1041    0     2     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0  765     5     0 1202   996  1041    0     2     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 1.00  1.00  1.00 0.95  0.85  0.92 1.00  0.85  1.00 1.00  1.00
Lanes:       0.00 0.99  0.01  0.00 2.00  1.00  2.00 0.00  1.00  0.00 0.00  1.00
Final Sat.:     0 1886    12     0 3610  1615  3502    0  1615     0    0  1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.41  0.41  0.00 0.33  0.62  0.30 0.00  0.00  0.00 0.00  0.00
Crit Moves:                               ****  ****
Green/Cycle: 0.00 0.61  0.61  0.00 0.61  0.61  0.30 0.00  0.30  0.00 0.00  0.00
Volume/Cap:  0.00 0.66  0.66  0.00 0.54  1.00  1.00 0.00  0.00  0.00 0.00  0.00
Delay/Veh:    0.0 14.2  14.2   0.0 11.0  46.7  60.4  0.0  22.3   0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 14.2  14.2   0.0 11.0  46.7  60.4  0.0  22.3   0.0  0.0   0.0
DesignQueue:    0   17     0     0   25    22    39    0     0     0    0     0
********************************************************************************
```

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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM 4-Way Stop Method (Future Volume Alternative)
******************************************************************************
Intersection #65 Derby Street / Warring Street
******************************************************************************
Cycle (sec):       100              Critical Vol./Cap. (X):        1.828
Loss Time (sec):     0 (Y+R =  4 sec) Average Delay (sec/veh):     312.3
Optimal Cycle:       0              Level Of Service:                  F
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       0  0  0  0  0   0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      0    0    0   765    0   30     7   62    0     0   75  780
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   0    0    0   765    0   30     7   62    0     0   75  780
Added Vol:     0    0    0   180    0    0     0    0    0     0    0   28
PasserByVol:   0    0    0   110    0   10     0    0    0     0    0  120
Initial Fut:   0    0    0  1055    0   40     7   62    0     0   75  928
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    0    0    0  1055    0   40     7   62    0     0   75  928
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   0    0    0  1055    0   40     7   62    0     0   75  928
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:    0    0    0  1055    0   40     7   62    0     0   75  928
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.00 0.00 0.00  0.96 0.00 0.04  0.10 0.90 0.00  0.00 0.07 0.93
Final Sat.:    0    0    0   577    0   22    53  471    0     0   50  624
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     xxxx xxxx xxxx  1.83 xxxx 1.83  0.13 0.13 xxxx  xxxx 1.49 1.49
Crit Moves:                       ****            ****             ****
Delay/Veh:    0.0  0.0  0.0 394.6  0.0 394.6 10.9 10.9  0.0   0.0  243 243.1
Delay Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   0.0  0.0  0.0 394.6  0.0 394.6 10.9 10.9  0.0   0.0  243 243.1
LOS by Move:   *    *    *     F    *    F     B    B    *     *    F    F
ApproachDel:    xxxxxx          394.6            10.9            243.1
Delay Adj:       xxxxx           1.00            1.00             1.00
ApprAdjDel:     xxxxxx          394.6            10.9            243.1
LOS by Appr:       *               F               B                F
******************************************************************************
```



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------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Future Volume Alternative)
******************************************************************************
Intersection #66 Derby Street / Claremont Blvd.
******************************************************************************
Cycle (sec):        65              Critical Vol./Cap. (X):        0.870
Loss Time (sec):     8 (Y+R =  5 sec) Average Delay (sec/veh):      35.6
Optimal Cycle:      72              Level Of Service:                  D
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   18    0   18     0    0    0     0   35   35    35   35    0
Lanes:       0  0  1! 0  0   0  0  0  0  0   0  0  0  1  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      4    0  225     0    0    0     0  872   11    31  741    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   4    0  225     0    0    0     0  872   11    31  741    0
Added Vol:     0    0    0     0    0    0     0  180    0     0   28    0
PasserByVol:   0    0    0     0    0    0     0  120    0     0  120    0
Initial Fut:   4    0  225     0    0    0     0 1172   11    31  889    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    4    0  225     0    0    0     0 1172   11    31  889    0
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   4    0  225     0    0    0     0 1172   11    31  889    0
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Final Vol.:    4    0  225     0    0    0     0 1172   11    31  889    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900
Adjustment:  0.86 1.00 0.86  1.00 1.00 1.00  1.00 1.00 1.00  0.94 0.94 1.00
Lanes:       0.02 0.00 0.98  0.00 0.00 0.00  0.00 0.99 0.01  0.03 0.97 0.00
Final Sat.:    29    0 1614     0    0    0     0 1880   18    60 1728    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.14 0.00 0.14  0.00 0.00 0.00  0.00 0.62 0.62  0.51 0.51 0.00
Crit Moves:  ****                                 ****
Green/Cycle: 0.28 0.00 0.28  0.00 0.00 0.00  0.00 0.60 0.60  0.60 0.60 0.00
Volume/Cap:  0.50 0.00 0.50  0.00 0.00 0.00  0.00 1.04 1.04  0.86 0.86 0.00
Delay/Veh:   23.7  0.0 23.7   0.0  0.0  0.0   0.0 50.3 50.3  19.6 19.6  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  23.7  0.0 23.7   0.0  0.0  0.0   0.0 50.3 50.3  19.6 19.6  0.0
DesignQueue:    0    0    6     0    0    0     0   20    0     1   15    0
******************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #67 Ashby Avenue / Seventh Street
********************************************************************************
Cycle (sec):        110                Critical Vol./Cap. (X):        1.131
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):        95.0
Optimal Cycle:      180                Level Of Service:                  F
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted      Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  1  0  1  0   0  1  0  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     134  404    68   107  270   476   263  546   113    98  774    31
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  134  404    68   107  270   476   263  546   113    98  774    31
Added Vol:      0    0     0     0    0     0     0   14     0     0   95     0
Future:        60   60    10    90   30     0    30   60    60    20   60    70
Initial Fut:  194  464    78   197  300   476   293  620   173   118  929   101
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   194  464    78   197  300   476   293  620   173   118  929   101
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  194  464    78   197  300   476   293  620   173   118  929   101
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   194  464    78   197  300   476   293  620   173   118  929   101
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.48 0.48  0.48  0.52 0.52  0.52  0.95 0.92  0.92  0.95 0.94  0.94
Lanes:       0.53 1.26  0.21  0.40 0.62  0.98  1.00 1.56  0.44  1.00 1.80  0.20
Final Sat.:   481 1151   194   401  611   969  1805 2729   762  1805 3207   349
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.40 0.40  0.40  0.49 0.49  0.49  0.16 0.23  0.23  0.07 0.29  0.29
Crit Moves:                        ****             ****             ****
Green/Cycle: 0.43 0.43  0.43  0.43 0.43  0.43  0.20 0.20  0.20  0.26 0.26  0.26
Volume/Cap:  0.93 0.93  0.93  1.13 1.13  1.13  0.81 1.13  1.13  0.26 1.13  1.13
Delay/Veh:   48.2 48.2  48.2 104.7  105 104.7  61.6  123 122.6  34.5  115 114.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  48.2 48.2  48.2 104.7  105 104.7  61.6  123 122.6  34.5  115 114.6
DesignQueue:    7   17     3     7   11    18    15   32     9     5   45     5
********************************************************************************
```



```
--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #68 Ashby Avenue / San Pablo Avenue
********************************************************************************
Cycle (sec):        110                Critical Vol./Cap. (X):        0.893
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        41.3
Optimal Cycle:      100                Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    4   17    17    4   19    19   18   18    18   18   18    18
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  1  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 4 Dec 2002 << 4:00-6:00 PM
Base Vol:     162  999    79   185  873   113    86  592   170    20  612   143
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  162  999    79   185  873   113    86  592   170    20  612   143
Added Vol:     13   26    28     0   14    16     0   11     3    58   65     0
Future:        20  190    90    20  320    30    20   90    50    40   90    30
Initial Fut:  195 1215   197   205 1207   159   106  693   223   118  767   173
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   195 1215   197   205 1207   159   106  693   223   118  767   173
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  195 1215   197   205 1207   159   106  693   223   118  767   173
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   195 1215   197   205 1207   159   106  693   223   118  767   173
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.93  0.93  0.95 0.93  0.93  1.00 0.92  0.92  0.88 0.88  0.88
Lanes:       1.00 1.72  0.28  1.00 1.77  0.23  1.00 1.51  0.49  0.22 1.45  0.33
Final Sat.:  1805 3041   493  1805 3136   413  1900 2633   847   375 2437   550
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.40  0.40  0.11 0.38  0.38  0.06 0.26  0.26  0.31 0.31  0.31
Crit Moves:       ****        ****                                   ****
Green/Cycle: 0.13 0.50  0.50  0.11 0.48  0.48  0.31 0.31  0.31  0.31 0.31  0.31
Volume/Cap:  0.80 0.80  0.80  1.00 0.80  0.80  0.18 0.84  0.84  1.00 1.00  1.00
Delay/Veh:   63.6 25.6  25.6 112.3 27.2  27.2  26.9 40.1  40.1  65.1 65.1  65.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  63.6 25.6  25.6 112.3 27.2  27.2  26.9 40.1  40.1  65.1 65.1  65.1
DesignQueue:   11   41     7    11   42     6     5   31    10     5   35     8
********************************************************************************
```

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-------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #69 Ashby Avenue / Adeline Street
*******************************************************************************
Cycle (sec):        140             Critical Vol./Cap. (X):        0.629
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):      39.5
Optimal Cycle:       86             Level Of Service:                  D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    4   32    32    6   38    38    4   22    22    4   32    32
Lanes:       1  0  1  1  0   1  0  2  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     92  693    85   31  700   169  135  491    39   68  547    39
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  92  693    85   31  700   169  135  491    39   68  547    39
Added Vol:     1    2     0    0   16    45    6   22     4    0   57     0
Future:       60   70    10   10   10    80   50  160    20   10   50    10
Initial Fut: 153  765    95   41  726   294  191  673    63   78  654    49
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:  153  765    95   41  726   294  191  673    63   78  654    49
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 153  765    95   41  726   294  191  673    63   78  654    49
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:  153  765    95   41  726   294  191  673    63   78  654    49
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.95 0.93  0.93 0.95 0.87  0.87 0.95 0.94  0.94 0.95 0.94  0.94
Lanes:       1.00 1.78  0.22 1.00 2.14  0.86 1.00 1.83  0.17 1.00 1.86  0.14
Final Sat.:  1805 3160   392 1805 3533  1431 1805 3258   305 1805 3325   249
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.24  0.24 0.02 0.21  0.21 0.11 0.21  0.21 0.04 0.20  0.20
Crit Moves:  ****                  ****        ****                  ****
Green/Cycle: 0.13 0.42  0.42 0.04 0.33  0.33 0.17 0.40  0.40 0.08 0.31  0.31
Volume/Cap:  0.63 0.58  0.58 0.53 0.63  0.63 0.63 0.52  0.52 0.52 0.63  0.63
Delay/Veh:   62.4 31.8  31.8 72.4 40.7  40.7 62.2 29.0  29.0 71.8 41.3  41.3
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  62.4 31.8  31.8 72.4 40.7  40.7 62.2 29.0  29.0 71.8 41.3  41.3
DesignQueue:   11   37     5    3   40    16   13   33     3    6   37     3
*******************************************************************************
```



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-------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #70 Ashby Avenue / Shattuck Avenue
*******************************************************************************
Cycle (sec):         80             Critical Vol./Cap. (X):        0.732
Loss Time (sec):     12 (Y+R =  4 sec) Average Delay (sec/veh):      43.3
Optimal Cycle:       60             Level Of Service:                  D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:   21   21    21    6   21    21   20   20    20   20   20    20
Lanes:       0  1  0  1  0   0  1  0  1  0   0  1  0  1  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     52  556    30  200  585    56   33  536    40   32  541   176
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  52  556    30  200  585    56   33  536    40   32  541   176
Added Vol:     0   14     0   33  104    56    7   14     0    0    1     3
Future:       10   10    10   20   20    10   10  170    20   10   60    20
Initial Fut:  62  580    40  253  709   122   50  720    60   42  602   199
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   62  580    40  253  709   122   50  720    60   42  602   199
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  62  580    40  253  709   122   50  720    60   42  602   199
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Final Vol.:   62  580    40  253  709   122   50  720    60   42  602   199
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900 1900  1900
Adjustment:  0.49 0.49  0.49 0.89 0.89  0.89 0.90 0.90  0.90 0.88 0.88  0.88
Lanes:       0.18 1.70  0.12 0.47 1.31  0.22 0.12 1.74  0.14 0.10 1.43  0.47
Final Sat.:   168 1573   108  791 2217   381  205 2958   246  166 2376   785
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.37 0.37  0.37 0.32 0.32  0.32 0.24 0.24  0.24 0.25 0.25  0.25
Crit Moves:       ****                                                ****
Green/Cycle: 0.33 0.33  0.33 0.32 0.32  0.32 0.52 0.52  0.52 0.52 0.52  0.52
Volume/Cap:  1.13 1.13  1.13 0.98 0.98  0.98 0.46 0.46  0.46 0.48 0.48  0.48
Delay/Veh:  106.7  107 106.7 50.4 50.4  50.4 12.8 12.8  12.8 13.0 13.0  13.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 106.7  107 106.7 50.4 50.4  50.4 12.8 12.8  12.8 13.0 13.0  13.0
DesignQueue:    2   18     1    8   23     4    1   16     1    1   13     4
*******************************************************************************
```

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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #71 Ashby Avenue / Telegraph Avenue
********************************************************************************
Cycle (sec):          80               Critical Vol./Cap. (X):        1.009
Loss Time (sec):      12 (Y+R =  6 sec) Average Delay (sec/veh):        27.1
Optimal Cycle:       108               Level Of Service:                  C
********************************************************************************
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Prot+Permit        Protected         Protected
Rights:          Include           Include           Include           Include
Min. Green:    21   21    21     6   21    21    25   25    25    25   25    25
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:     210  675    75   176  902    63    68  531   184   148  642    99
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  210  675    75   176  902    63    68  531   184   148  642    99
Added Vol:      1    4     0     2   25     0     0   44     3     0    3     0
Future:        30   80    10    10   60    10    30  110    50    20   50    20
Initial Fut:  241  759    85   188  987    73    98  685   237   168  695   119
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   241  759    85   188  987    73    98  685   237   168  695   119
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  241  759    85   188  987    73    98  685   237   168  695   119
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:   241  759    85   188  987    73    98  685   237   168  695   119
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.94  0.94  0.56 0.94  0.94  0.95 0.91  0.91  0.95 0.93  0.93
Lanes:       1.00 1.80  0.20  1.00 1.86  0.14  1.00 1.49  0.51  1.00 1.71  0.29
Final Sat.:  1805 3198   358  1070 3328   246  1805 2577   892  1805 3014   516
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.24  0.24  0.18 0.30  0.30  0.05 0.27  0.27  0.09 0.23  0.23
Crit Moves:  ****                   ****              ****       ****
Green/Cycle: 0.35 0.35  0.35  0.94 0.46  0.46  0.35 0.35  0.35  0.35 0.35  0.35
Volume/Cap:  0.38 0.68  0.68  0.19 0.65  0.65  0.16 0.76  0.76  0.27 0.66  0.66
Delay/Veh:   25.7 30.2  30.2   3.0 20.1  20.1  23.8 34.4  34.4  25.3 31.3  31.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  25.7 30.2  30.2   3.0 20.1  20.1  23.8 34.4  34.4  25.3 31.3  31.3
DesignQueue:    9   30     3     6   33     2     4   27    10     6   28     5
********************************************************************************
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--------------------------------------------------------------------------------
                              365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                  PM Peak Hour
--------------------------------------------------------------------------------
                        Level Of Service Computation Report
            2000 HCM Operations Method (Future Volume Alternative)
********************************************************************************
Intersection #72 Ashby Avenue / College Avenue
********************************************************************************
Cycle (sec):          80               Critical Vol./Cap. (X):        0.970
Loss Time (sec):       8 (Y+R =  4 sec) Average Delay (sec/veh):        40.1
Optimal Cycle:       136               Level Of Service:                  D
********************************************************************************
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted         Permitted         Permitted         Permitted
Rights:          Include           Include           Include           Include
Min. Green:    18   18    18    18   18    18    30   30    30    30   30    30
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      75  293    68   159  279    58    15  683    87    10  466   151
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   75  293    68   159  279    58    15  683    87    10  466   151
Added Vol:      0    4     0    46   23    -2     2   43     0     0    5     9
Future:        10   60    10    20   60    10    10  120    20    10   60    30
Initial Fut:   85  357    78   225  362    66    27  846   107    20  531   190
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    85  357    78   225  362    66    27  846   107    20  531   190
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   85  357    78   225  362    66    27  846   107    20  531   190
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    85  357    78   225  362    66    27  846   107    20  531   190
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.78 0.78  0.78  0.99 0.99  0.99  0.99 0.99  0.99  0.97 0.97  0.97
Lanes:       0.16 0.69  0.15  0.34 0.56  0.10  0.03 0.86  0.11  0.03 0.72  0.25
Final Sat.:   243 1021   223   646 1039   189    52 1616   204    49 1314   470
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.35 0.35  0.35  0.35 0.35  0.35  0.52 0.52  0.52  0.40 0.40  0.40
Crit Moves:       ****                              ****
Green/Cycle: 0.38 0.38  0.38  0.38 0.38  0.38  0.53 0.53  0.53  0.53 0.53  0.53
Volume/Cap:  0.93 0.93  0.93  0.93 0.93  0.93  1.00 1.00  1.00  0.77 0.77  0.77
Delay/Veh:   48.6 48.6  48.6  44.5 44.5  44.5  47.0 47.0  47.0  21.1 21.1  21.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  48.6 48.6  48.6  44.5 44.5  44.5  47.0 47.0  47.0  21.1 21.1  21.1
DesignQueue:    3   11     2     7   11     2     1   21     3     0   12     4
********************************************************************************
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-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                               PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #73 Ashby Avenue / Claremont Avenue
*******************************************************************************
Cycle (sec):         70                Critical Vol./Cap. (X):        0.781
Loss Time (sec):     12 (Y+R = 12 sec) Average Delay (sec/veh):        26.8
Optimal Cycle:       72                Level Of Service:                  C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Permitted        Permitted
Rights:           Include          Include          Include          Include
Min. Green:    16   16    16    16   16    16    28   28    28    28   28    28
Lanes:        0  1  0  1  0    1  1  0  1  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 20 Nov 2002 << 4:00 - 6:00 PM
Base Vol:      45  373   189   432  285    49    47  592     5    66  504   232
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   45  373   189   432  285    49    47  592     5    66  504   232
Added Vol:      0    0     0   180    0     0     0   90     0     0   14    28
Future:        10   60    20    60   50    20    40  130    10    10   60    20
Initial Fut:   55  433   209   672  335    69    87  812    15    76  578   280
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    55  433   209   672  335    69    87  812    15    76  578   280
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   55  433   209   672  335    69    87  812    15    76  578   280
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:    55  433   209   672  335    69    87  812    15    76  578   280
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
Lanes:       0.16 1.24  0.60  1.88 0.93  0.19  0.19 1.78  0.03  0.16 1.24  0.60
Final Sat.:   285 2243  1082  3382 1686   347   344 3207    59   294 2234  1082
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.19  0.19  0.20 0.20  0.20  0.25 0.25  0.25  0.26 0.26  0.26
Crit Moves:  ****                   ****                              ****
Green/Cycle: 0.22 0.22  0.22  0.22 0.22  0.22  0.39 0.39  0.39  0.39 0.39  0.39
Volume/Cap:  0.87 0.87  0.87  0.89 0.89  0.89  0.65 0.65  0.65  0.67 0.67  0.67
Delay/Veh:   37.0 37.0  37.0  36.0 36.0  36.0  17.4 17.4  17.4  17.7 17.7  17.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  37.0 37.0  37.0  36.0 36.0  36.0  17.4 17.4  17.4  17.7 17.7  17.7
DesignQueue:    2   14     7    22   11     2     2   21     0     2   15     7
*******************************************************************************
```



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-------------------------------------------------------------------------------
                           365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                               PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Future Volume Alternative)
*******************************************************************************
Intersection #74 Tunnel Road / SR 13
*******************************************************************************
Cycle (sec):         65                Critical Vol./Cap. (X):        0.905
Loss Time (sec):      8 (Y+R =  4 sec) Average Delay (sec/veh):        16.9
Optimal Cycle:       83                Level Of Service:                  B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include           Ovl
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  2  0  1    2  0  1  0  0    0  0  0  0  0    1  0  0  0  2
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 21 Nov 2002 << 4:00 - 6:00 PM
Base Vol:       0 1130   256   534 1095     0     0    0     0   128    0   155
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1130   256   534 1095     0     0    0     0   128    0   155
Added Vol:      0   42     0   132  138     0     0    0     0     0    0     0
Future:         0   80     0    70  140     0     0    0     0     0    0    10
Initial Fut:    0 1252   256   736 1373     0     0    0     0   128    0   165
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0 1252   256   736 1373     0     0    0     0   128    0   165
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1252   256   736 1373     0     0    0     0   128    0   165
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Final Vol.:     0 1252   256   736 1373     0     0    0     0   128    0   165
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  1.00 0.95  0.85  0.92 1.00  1.00  1.00 1.00  1.00  0.95 1.00  0.75
Lanes:       0.00 2.00  1.00  2.00 1.00  0.00  0.00 0.00  0.00  1.00 0.00  2.00
Final Sat.:     0 3610  1615  3502 1900     0     0    0     0  1805    0  2842
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.35  0.16  0.21 0.72  0.00  0.00 0.00  0.00  0.07 0.00  0.06
Crit Moves:  ****                   ****                        ****
Green/Cycle: 0.00 0.50  0.50  0.30 0.80  0.00  0.00 0.00  0.00  0.08 0.00  0.38
Volume/Cap:  0.00 0.70  0.32  0.70 0.90  0.00  0.00 0.00  0.00  0.90 0.00  0.15
Delay/Veh:    0.0 13.8  10.0  22.2 12.8   0.0   0.0  0.0   0.0  78.0  0.0  13.3
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 13.8  10.0  22.2 12.8   0.0   0.0  0.0   0.0  78.0  0.0  13.3
DesignQueue:    0   25     5    20   12     0     0    0     0     4    0     4
*******************************************************************************
```

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Cum+UC Proj+25 Inc Var+LBNLWed May 12, 2004 10:59:38            Page 83-1
-------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #167 Piedmont Avenue / Channing Way
*******************************************************************************
Average Delay (sec/veh): OVERFLOW          Worst Case Level Of Service:       F
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      85  311    45    43  406    85    42   59    87    36  109    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   85  311    45    43  406    85    42   59    87    36  109    15
Added Vol:      4   22     0     0  115     7    36    0    41     0    0     0
Future:        14   53     8     7   69    14     7   10    15     6   19     3
Initial Fut:  103  386    53    50  590   106    85   69   143    42  128    18
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   103  386    53    50  590   106    85   69   143    42  128    18
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:   103  386    53    50  590   106    85   69   143    42  128    18
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  696 xxxx xxxxx   439 xxxx xxxxx  1435 1388   643  1468 1415   413
Potent Cap.:  909 xxxx xxxxx  1132 xxxx xxxxx   113  144   477   107  139   644
Move Cap.:    909 xxxx xxxxx  1132 xxxx xxxxx     0  121   477    36  117   644
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:  9.5 xxxx xxxxx   8.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx   83 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  692 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           692.4
ApproachLOS:        *                *                F                F
```



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Cum+UC Proj+25 Inc Var+LBNLWed May 12, 2004 10:59:38            Page 84-1
-------------------------------------------------------------------------------
                             365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                                 PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #1121 Highland Place / Heart Avenue / Cyclotron Road
*******************************************************************************
Average Delay (sec/veh):      0.7          Worst Case Level Of Service:       C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        1  0  0  0  0    0  0  1! 0  0    0  1  0  0  0    0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       2    0     0     5    2    13    11   56     0     0  342    43
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    2    0     0     5    2    13    11   56     0     0  342    43
Added Vol:      0    0     0     0    0     0     0   22     0     0  104     0
Future:         1    0     0     2    1     6     5   26     0     0  161    20
Initial Fut:    3    0     0     7    3    19    16  104     0     0  607    63
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     3    0     0     7    3    19    16  104     0     0  607    63
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     3    0     0     7    3    19    16  104     0     0  607    63
Critical Gap Module:
Critical Gp:  7.1 xxxx xxxxx   7.1  6.5   6.2   4.1 xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:  3.5 xxxx xxxxx   3.5  4.0   3.3   2.2 xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  786 xxxx xxxxx   775  775   639   670 xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.:  312 xxxx xxxxx   318  331   480   930 xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:    294 xxxx xxxxx   314  326   480   930 xxxx xxxxx  xxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del: 17.4 xxxx xxxxx xxxxx xxxx xxxxx   8.9 xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    C    *     *     *    *     *     A    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx  408 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx 14.5 xxxxx   8.9 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    B     *     A    *     *     *    *     *
ApproachDel:      17.4             14.5           xxxxxx           xxxxxx
ApproachLOS:        C                B                *                *
```

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-------------------------------------------------------------------------------
                          365330 LBNL LRDP EIR
Cumulative (2020) + UCB LRDP Project + Increment to '25 + LBNL LRDP Project (Va
                              PM Peak Hour
-------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #1122 Stadium Rim Road / Canyon Road
*******************************************************************************
Average Delay (sec/veh):      0.2          Worst Case Level Of Service:       B
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  1  0    0  0  1  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  265     3     0  251     0     0    0     0     6    0     1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  265     3     0  251     0     0    0     0     6    0     1
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Future:         0   44     1     0   43     0     0    0     0     1    0     0
Initial Fut:    0  309     4     0  294     0     0    0     0     7    0     1
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  309     4     0  294     0     0    0     0     7    0     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Final Vol.:     0  309     4     0  294     0     0    0     0     7    0     1
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4 xxxx   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   605 xxxx   311
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   464 xxxx   734
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   464 xxxx   734
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
Stopped Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  486 xxxxx
Shrd StpDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.5 xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    B     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            12.5
ApproachLOS:        *                *                *                B
```