4.8 TRANSPORTATION AND TRAFFIC

4.8.1 INTRODUCTION

This section describes the existing transportation setting and analyzes the potential impacts of the proposed Solar Energy Research Center (SERC) project on transportation and traffic.

Information used in the analysis below was obtained from the Lawrence Berkeley National Laboratory (LBNL) 2006 Long Range Development Plan (LRDP) Environmental Impact Report (EIR), environmental documents associated with specific LBNL projects, and the SERC project traffic analysis prepared by Fehr & Peers.

In response to the Notice of Preparation circulated for this EIR, a commenter expressed concern regarding truck traffic on Hearst Avenue. This issue is addressed in the impact assessment presented below.

4.8.2 ENVIRONMENTAL SETTING

This section describes the existing transportation and traffic conditions in the vicinity of the SERC project site, including the roadway system, weekday peak hour intersection operations, parking, transit service, and bicycle and pedestrian circulation.

Existing Roadway Network

The SERC project would be located in the center of the LBNL hill site in Berkeley, California in the “Old Town” area. Access to the proposed project would be provided through the existing LBNL gates and McMillan Road. Figure 4.8-1, Study Intersection Locations, Lane Configurations and Traffic Control, shows the LBNL hill site, the surrounding roadway system, and intersections analyzed as part of this analysis. The regional and local roadways serving the project site, as well as the internal circulation within the site are described below.

Regional Roadways

**Interstate I-80** connects the San Francisco Bay Area with the Sacramento region and continues east. Within Berkeley, I-80 is oriented in a north-south direction along the western edge of the city 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, Interstate 580 (I-580) interchange operate at capacity during the peak commute hours. I-80 between Emeryville and Albany is also I-580.
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 near Berkeley. This is the primary route used by Berkeley-bound travelers from Contra Costa County. The primary access routes from SR-24 to the LBNL area are SR-13 (Ashby Avenue) to the Belrose-Derby-Warring-Piedmont corridor, and Telegraph Avenue.

State Route 13/Ashby Avenue (SR-13) connects 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 generally east-west two-lane arterial through the city. Ashby Avenue intersects the major north-south roadways in Berkeley, providing several routes toward LBNL and University of California (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.

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 provides 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 arterial, with parallel parking provided on both sides of the roadway.

Belrose-Derby-Warring-Piedmont Corridor is a heavily used route connecting SR-24 with Berkeley’s Southside area (i.e., the area just south of the UC Berkeley campus), UC Berkeley, and LBNL. With a single travel lane in each direction, the route is at or near 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.

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 in each direction, 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. Hearst Avenue is designated as a bicycle lane (Class II) west of Shattuck Avenue and a bicycle route (Class III) east of Shattuck Avenue.
Study Intersection Locations, Lane Configurations and Traffic Control

FIGURE 4.8-1

LEGEND
1. Study Intersections
2. Traffic Signal

SOURCE: Fehr & Peers Traffic Consultants – March 2010

NOT TO SCALE
Local Roadways

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.

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.

La Loma Avenue/Gayley Road is a two-lane, north-south 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 surrounding parking facilities. Stadium Rim Way also intersects with Centennial Drive, indirectly providing access to the Lawrence Hall of Science (LHS), the Botanical Garden, the Strawberry Canyon Recreational Area, and the LBNL gates on Centennial Drive. On-street parking on Stadium Rim Way is controlled by UC Berkeley. Sidewalks and 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.

Centennial Drive borders the east and south perimeters of LBNL. It connects Grizzly Peak Boulevard and Stadium Rim Way and provides access to the LBNL hill site through the Strawberry Canyon and Grizzly Peak gates. Centennial Drive also provides access to LHS, 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 grades and sharp curves, where the speed limit is reduced to 15 miles per hour.

Grizzly Peak Boulevard is a two-lane, two-way roadway located in the hills of Berkeley, connecting Skyline Boulevard in the Sibley Volcanic Regional Preserve in the south, to Spruce Street near the Summit Reservoir in north Berkeley. The narrow and curvy roadway does not provide any pedestrian or bicyclist
amenities south of Centennial Drive. The roadway provides access to parking facilities and trails in Tilden Regional Park, and to SR-24.

**Internal Circulation**

The LBNL hill site is served by an east-west traffic circulation system that generally conforms to the contours of the site’s topography. Employees and visitors access the site through three gates. The Blackberry Canyon Gate, on the west of the site, is accessed via Cyclotron Road and connects to Hearst Avenue. The Strawberry Canyon and Grizzly Peak gates, on the east of the site, are accessed via Centennial Drive. The three gates are attended by security personnel during business hours and accessible by a card access system at other times. The site’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.

**Traffic Operations Analysis**

The LBNL 2006 LRDP EIR included traffic operations analysis at 20 study intersections. The EIR found that cumulative traffic of LBNL, including a conceptual version of SERC, would result in significant cumulative impacts at three intersections. In July 2010, a supplemental traffic study, prompted by change in Berkeley LOS standard, was completed as part of the Seismic Phase 2 Project EIR which revised the 2006 LRDP EIR’s conclusion and identified one more intersection (for a total of 4 intersections) that would experience significant cumulative impacts. The 2010 supplemental traffic study included all cumulative development identified in this EIR. The baseline and cumulative conditions have not worsened since the 2010 supplemental traffic study. Therefore, this EIR tiers off the conclusions of 2006 LRDP EIR regarding cumulative traffic impacts. Those conclusions, as updated by 2010 supplemental traffic study, show that only these four intersections have any potential to operate at unacceptable levels of service. These are also the four intersections in the immediate vicinity of the LBNL hill site, which would experience the greatest increases in traffic due to the proposed project. The four intersections are:

- Hearst Avenue/Gayley Road/La Loma Avenue
- Bancroft Way/Piedmont Avenue
- Stadium Rim Way/Gayley Road
- Durant Avenue/Piedmont Avenue

**Figure 4.8-1** shows the location of the study intersections and their configuration and control. Intersection operations during typical weekday AM and PM peak hours at the study intersections were evaluated.
Intersection Operation Analysis Method

Transportation engineers and planners commonly use a grading system called Level of Service (LOS) to measure and describe the operation of a local roadway network. The LOS grading system qualitatively characterizes traffic conditions associated with varying levels of traffic.

LOS varies from LOS A, indicating free flow traffic conditions with little or no delay, to LOS F, representing over-saturated conditions where traffic flows exceed design capacity, resulting in long queues and delays. The LOS grading system is applied to the signalized and unsignalized intersection analysis.

Signalized Intersection traffic conditions and resulting LOS are determined using the *Highway Capacity Manual (HCM)—Special Report 209* (Transportation Research Board, 2000) method for signalized intersections. This method uses intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the control delay per vehicle. Control delay is defined as total delay attributed to signal operations and includes initial deceleration, queue move up time, stopped delay, and acceleration delay. The LOS for a signalized intersection is based on the average control delay per vehicle for the intersection measured in seconds. *Table 4.8-1, Signalized Intersection Level of Service Criteria,* summarizes the LOS criteria for signalized intersections.

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description of Traffic Conditions</th>
<th>Average Control Delay (seconds/vehicle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Operations with very low delay occurring with favorable progression and/or short cycle lengths.</td>
<td>≤ 10.0</td>
</tr>
<tr>
<td>B</td>
<td>Operations with low delay occurring with good progression and/or short cycle lengths.</td>
<td>10.1 – 20.0</td>
</tr>
<tr>
<td>C</td>
<td>Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear. Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high volume/capacity ratios. Many vehicles stop and individual cycle failures are noticeable.</td>
<td>20.1 – 35.0</td>
</tr>
<tr>
<td>D</td>
<td>Operations with high delay values indicating poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.</td>
<td>35.1 – 55.0</td>
</tr>
<tr>
<td>E</td>
<td>Operations with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.</td>
<td>55.1 – 80.0</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>&gt; 80.0</td>
</tr>
</tbody>
</table>

*Source: Highway Capacity Manual (Transportation Research Board, 2000), Chapter 16 – Signalized Intersections*
Unsignalized Intersections (four-way stop-controlled and side street stop-controlled) are evaluated using the HCM – Special Report 209 (Transportation Research Board, 2000) method for unsignalized intersections. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each stop-controlled movement. This incorporates delay associated with deceleration, acceleration stopping, and moving up in the queue. However, the method does not account for additional delays caused by pedestrian crossings. For side street stop-controlled intersections, the delay is typically reported for the worst movement from the minor approaches only. Table 4.8-2, Unsignalized Intersection Level of Service Criteria, summarizes the relationship between delay and LOS for unsignalized intersections.

Existing Intersection Volumes

The intersection operations analysis presented in this study are based on AM and PM peak period (7:00 to 9:00 AM and 4:00 to 6:00 PM) intersection turning movement volumes collected in 2002 and used in the UC Berkeley 2020 LRDP EIR and LBNL 2006 LRDP EIR. More recent count data at the study intersections was collected in 2006, 2007, and 2008; however, the 2002 data were used because the 2002 traffic volumes are generally higher than the more recent volumes and thus would result in a more conservative analysis.

Figure 4.8-2, Existing Peak Hour Traffic Volumes, presents the existing AM and PM peak hour intersection volumes at the study intersections.

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description of Traffic Conditions</th>
<th>Average Control Delay (seconds/vehicle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Little or no conflicting traffic for minor street approach.</td>
<td>≤ 10</td>
</tr>
<tr>
<td>B</td>
<td>Minor street approach begins to notice absence of available gaps.</td>
<td>10 – 15</td>
</tr>
<tr>
<td>C</td>
<td>Minor street approach begins experiencing delay for available gaps.</td>
<td>15 – 25</td>
</tr>
<tr>
<td>D</td>
<td>Minor street approach experiences queuing due to a reduction in available gaps.</td>
<td>25 – 35</td>
</tr>
<tr>
<td>E</td>
<td>Extensive minor street queuing due to insufficient gaps.</td>
<td>35 – 50</td>
</tr>
<tr>
<td>F</td>
<td>Insufficient gaps of suitable size to allow minor street traffic demand to cross safely through a major traffic stream.</td>
<td>&gt; 50</td>
</tr>
</tbody>
</table>

Source: Highway Capacity Manual (Transportation Research Board, 2000), Chapter 17 – Unsignalized Intersections
LEGEND
1 Study Intersections
XX (YY) AM (PM) Peak Hour

NOT TO SCALE

SOURCE: Fehr & Peers Traffic Consultants – March 2010

FIGURE 4.8-2

Existing Peak Hour Traffic Volumes
Existing Intersection Operations

Table 4.8-3, Existing Conditions – Study Intersection LOS Summary, summarizes existing weekday peak hour intersection LOS analysis results. Detailed calculation work sheets are provided in Appendix 4.8. As shown in the table, two of the four study intersections currently operate at LOS C during both AM and PM peak hours which is an acceptable LOS whereas two intersections operate at LOS E and F which represent congested conditions and delays for drivers. Based on current observations, the all-way stop-controlled Bancroft Way/Piedmont Avenue intersection operates at LOS F during both AM and PM peak hours. Northbound and southbound vehicle flows at this intersection are impeded by the high pedestrian volumes crossing Piedmont Avenue.

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Control</th>
<th>AM Peak Hour Delay (Seconds)¹</th>
<th>LOS ¹</th>
<th>PM Peak Hour Delay (Seconds)¹</th>
<th>LOS ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearst Avenue/Gayley Road/La Loma Avenue</td>
<td>Signalized</td>
<td>26</td>
<td>C</td>
<td>49</td>
<td>C</td>
</tr>
<tr>
<td>Stadium Rim Way/Gayley Road</td>
<td>All-Way Stop-Controlled</td>
<td>30</td>
<td>D</td>
<td>41</td>
<td>E</td>
</tr>
<tr>
<td>Bancroft Way/Piedmont Avenue</td>
<td>All-Way Stop-Controlled</td>
<td>&gt;60 (v/c = 0.95)</td>
<td>F</td>
<td>&gt;60 (v/c = 0.84)</td>
<td>F</td>
</tr>
<tr>
<td>Durant Avenue/Piedmont Avenue</td>
<td>All-Way Stop-Controlled</td>
<td>19</td>
<td>C</td>
<td>19</td>
<td>C</td>
</tr>
</tbody>
</table>


1 Signalized and all-way stop-controlled intersection delay and LOS based on average control delay per vehicle, according to the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000. For intersections operating at LOS F, the volume-to-capacity ratio (v/c) is also reported.

2 Based on the 2000 HCM methodology, the intersection currently operates at LOS D during the AM peak hour and LOS C during the PM peak hour. Based on field observations and measurements, the intersection currently operates at LOS F during both AM and PM peak hours due to the high number of pedestrian crossings, which the 2000 HCM methodology does not account for. Bold indicated an intersection operating at unacceptable LOS E or LOS F.

Existing Transit and Shuttle Services

The LBNL hill site is served indirectly by Bay Area Rapid Transit (BART), Alameda-Contra Costa Transit (AC Transit), and UC Berkeley Shuttle Service (Bear Transit) and directly by the LBNL shuttle service. Figure 4.8-3, Transit Routes in Project Vicinity, shows the transit routes in the vicinity of the project site. Each transit service is described below.
BART

BART provides regional commuter rail transit in Alameda, Contra Costa, San Francisco, and San Mateo counties. Currently, BART trains operate on weekdays from 4:00 AM to midnight, on Saturdays from 6:00 AM to midnight, and on Sundays from 8:00 AM to midnight. The minimum BART fare is currently $1.75. The nearest BART station to the SERC project is the Downtown Berkeley station located one block west of the UC Berkeley campus at the Center Street/Shattuck Avenue intersection (approximately 1.25 miles west of the project site). The LBNL shuttle service provides access between the LBNL hill site and the Downtown Berkeley BART Station.

AC Transit

Local bus service in Berkeley is provided by AC Transit. Within the City of Berkeley, at least one AC Transit route provides service within walking distance (0.25 mile) of nearly every resident in the city. Five bus routes provide service to the project area. Figure 4.8-3 illustrates the existing AC Transit routes in the vicinity of the LBNL hill site. Although these routes do not directly serve the LBNL hill site, the LBNL shuttle service provides access to them.

The following bus routes serve the project area:

- Line 49 provides service in clockwise and counterclockwise loops from the Rockridge BART station and travels along Piedmont Avenue and Bancroft Way/Durant Avenue couplet in the project area. It operates on 30-minute headways during the week between approximately 6:00 AM and 10:00 PM. On weekends, Line 49 operates with 60-minute headways between 7:00 AM and 8:00 PM.

- Line 51B provides service between the Berkeley Amtrak Station in West Berkeley and the Rockridge BART station and travels along College Avenue and Bancroft Way/Durant Avenue couplet in the project area. It operates daily on 8- to 20-minute headways during the day and 60-minute headways through the night as Line 851.

- Line 52 provides service between the University Village in Albany and the UC Berkeley campus and travels along Heart Avenue, Gayley Road, and Bancroft Way near the project site. Line 52 operates on 12- to 30-minute headways on weekdays between 6:00 AM and midnight and on 45-minute headways on weekends between 8:00 AM and 8:00 PM.

- Line 65 provides service between the Berkeley BART station and LHS through the North Berkeley Hills neighborhood. Headways for this line are 30 minutes on weekdays from approximately 6:00 AM to 9:00 PM. On weekends, the headways are 60 minutes from approximately 7:30 AM to 6:30 PM.

- The Transbay Line F provides service between the UC Berkeley campus and the Transbay Terminal in San Francisco. It operates along Gayley Road and Bancroft Way in the project area. It has 30-minute headways from 5:00 AM to midnight on weekdays.
Transit Routes in Project Vicinity

LEGEND:
- Blue = UCB Shuttles
- Green dashed = AC Transit
- Red = LBNL Shuttles
- Black dashed = Lawrence Berkeley National Laboratory Boundary


NOT TO SCALE

FIGURE 4.8-3
Additional AC Transit routes can be accessed in downtown Berkeley and Southside area through the LBNL shuttles.

**BEAR Transit**

BEAR Transit, operated by UC Berkeley, primarily serves the UC Berkeley community, providing service between the UC Berkeley campus, surrounding neighborhoods, and select destinations. In general, the daytime shuttles operate on a fixed route and schedule between 7:30 AM and 7:30 PM. The night shuttles operate on a fixed schedule between 7:30 PM and 3:00 AM, and provide door-to-door service throughout the service area between 2:00 AM and 6:00 AM.

All BEAR Transit shuttle buses, except the Richmond Field Station shuttle line, are free to UC Berkeley students, faculty, staff, post-docs, and visiting scholars, who have valid university identification. Others must pay a fare of $1.00. The Bear Transit Line H serves destinations along Centennial Drive, including the UC Berkeley Botanical Garden and LHS.

**LBNL Shuttles**

UC LBNL provides a free on-site and off-site shuttle service connecting the LBNL hill site to UC Berkeley, BART, AC Transit, and local neighborhoods. Current shuttle routes are described below.

- The Green Route operates internal to the hill site on weekdays from approximately 10:00 AM to noon and from 1:00 PM to 4:00 PM with 16-minute headways.

- The Orange Route operates in a counterclockwise loop between the LBNL hill site and the downtown Berkeley BART Station through Hearst Avenue and Centennial Drive on weekdays with 15-minute headways from 6:30 AM to 7:30 AM and 9:45 AM to 7:00 PM and with 10-minute headways from 7:40 AM to 9:40 AM.

- The Blue Route operates in a clockwise loop between the Downtown Berkeley BART Station, north side of the UC Berkeley campus, and the LBNL hill site through Hearst Avenue and Cyclotron Road on weekdays with 10-minute headways from 6:20 AM to 7:30 PM.

Although the LBNL shuttles are free, they are restricted to LBNL employees and visitors and shuttle riders are required to provide a valid identification to the driver. Shuttle stops are coordinated with AC Transit bus lines serving downtown Berkeley. The LBNL shuttles are equipped with bicycle racks. All of the shuttles listed above serve the project vicinity via stops on McMillan Road.
Existing Pedestrian and Bicycle Circulation

Most UC LBNL employees and visitors either drive or use transit to access the site. The hilly terrain and steep grades make walking or biking to the site difficult. Most walking and biking trips to the LBNL hill site are through the Blackberry Canyon Gate, which connects to the City’s sidewalks and bicycle facilities through Cyclotron Road and Hearst Avenue. The Strawberry Canyon and Grizzly Peak Gates can also be accessed by bicyclists using Centennial Drive and pedestrians using the intermittent paved sidewalks and unpaved paths along Centennial Drive. Many bicyclists also use the LBNL shuttles that are equipped with bicycle racks for their uphill inbound trip to the site and use their bicycles for the outbound downhill trip.

Within the site, pedestrian and bicycle paths meander and have many discontinuities. Pedestrian pathways primarily connect parking facilities and buildings. Although these paths are used for shorter trips within the site, the on-site shuttle service is typically used for longer trips.

Within the City of Berkeley, non-residential streets provide sidewalks and crosswalks for pedestrians. Currently, bicyclists are allowed on the roadways within the study area. However, the 2005 Berkeley Bicycle Plan Update does not identify any on-street bicycle facilities within the project area. Gayley Road, Piedmont Avenue, and Bancroft Way are identified as future Class 2.5 facilities (shared roadways where full bicycle lanes cannot be implemented but other improvements and amenities can be provided) and Stadium Rim Way and Centennial Drive are identified as future Class 3 facilities (signed bike routes). In addition, the UC Berkeley Campus Bicycle Plan recommends Gayley Road and Stadium Rim Way as future Class 2.5 facilities.

4.8.3 REGULATORY CONSIDERATIONS

Local Plans and Policies

The LBNL hill site is an approximately 200-acre site owned by the Regents of the University of California, where the University conducts research, service, and training work within the University’s mission. The LBNL hill site includes research and support structures that are primarily part of a multi-program national laboratory called the Lawrence Berkeley National Laboratory, a federally funded research and development center operated and managed by the University of California under a U.S. Department of Energy (DOE)-UC contract. UC LBNL is generally exempt from compliance with local land use regulations, including general plans and zoning. However, UC LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western half of the LBNL hill site is within the Berkeley city limits, and the eastern half is within the Oakland city limits. The SERC project site is located within Berkeley city boundary. This section
summarizes relevant principles, polices and guidelines contained in the LBNL 2006 LRDP, and the general plan of the City of Berkeley.

2006 LRDP Principles and Strategies

The 2006 LRDP proposes the following four fundamental principles that form the basis for the Plan's development strategies: (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."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP. Development strategies set forth in the 2006 LRDP applicable to transportation and traffic includes 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 Policy on Sustainable Practices 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; and

• 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 2006 LRDP and provide specific guidelines for site planning, landscape and building design as a means to implement the 2006 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 2006 LRDP.

The design guidelines would be applied to the proposed project as part of the 2006 LRDP program. As part of the design review and approval process, the proposed project would be evaluated for adherence to the LRDP Land Use Map, the design guidelines, the Building Heights Map, and 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 transportation and traffic analysis include the following:

• 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;
4.8 Transportation and Traffic

- Design all new streets to accommodate two-way traffic flow and pedestrian access;
- Reduce the amount of impermeable surfaces at the Berkeley 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; and
- Site and design parking structures to integrate with the natural surroundings.

**LBNL Construction Truck Traffic Control Program**

In the LBNL 2006 LRDP EIR,\(^1\) UC LBNL committed to minimizing construction traffic impacts on City streets (LBNL 2006).\(^2\) Pursuant to LRDP Best Practice TRANS-6c, UC LBNL has instituted a program to manage construction schedules of projects to minimize the overlap of heavy truck activity periods. As a part of this program, UC LBNL makes necessary adjustments to truck movements to keep the total number of one-way truck trips on the Hearst-Oxford-University Avenue truck route below 98 trips per day. UC LBNL has a full-time Site Construction Coordinator who oversees all construction activities, including traffic to and from the LBNL hill site. The Site Construction Coordinator is responsible for administering best management practices and ensuring that construction vehicle traffic does not contribute to a substantial increase in volumes or degradation in level of service on surrounding roadways.

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2. The 2006 LRDP EIR, under Impact TRANS-6 (focused on construction traffic), concluded that estimated construction truck traffic from the LBNL site including 65 one-way daily truck trips (33 trucks per day) in a peak year would not result in a significant impact to city intersections. An impact threshold for truck trips was not identified in the 2006 LRDP EIR. Since the certification of the 2006 LRDP EIR, in anticipation of concurrent construction of a number of large projects on the LBNL site, UC LBNL conducted a reevaluation of the traffic impacts associated with construction truck trips. This study, conducted by Fehr & Peers, examined the existing (2009) traffic conditions along the designated truck route from the LBNL site through the City of Berkeley to I-80, focusing on major intersections that are known to be operating at or near failing conditions. The study determined that so long as the total number of one-way truck trips from the LBNL site that pass through the Hearst Avenue, Oxford Street, and University Avenue intersections do not exceed 98 one-way truck trips per day (or 49 trucks per day) and LBNL’s construction truck traffic does not exceed 50 one-way truck trips (or 25 trucks a day) through the Gayley Road/Stadium Rim Way intersection, construction traffic would result in minimal effects on city intersections. The study utilized the City’s thresholds for traffic impacts that were amended after the certification of the LRDP EIR.
City of Berkeley General Plan

The Transportation Element of the Berkeley General Plan contains the following policies relevant to the proposed project:

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

2. Promoting express shuttle services to complement local transit service and ensure that Berkeley residents and commuters have information about shuttle services readily available

3. 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.

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 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-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.

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.

4.8.4 IMPACTS AND MITIGATION MEASURES

Significance Criteria

The impact of the proposed project on traffic and transportation 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:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

- 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;

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

- Result in inadequate emergency access; or

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.
4.8 Transportation and Traffic

The City of Berkeley’s Guidelines for the Development of Transportation Impact Reports sets forward the criteria for evaluating traffic-related impacts at signalized and unsignalized intersections. These criteria are used for evaluation of impacts under the first two CEQA criteria listed above. At signalized and all-way stop intersections, a significant impact would occur if as a result of the addition of project traffic:

- Intersection operations degrade from LOS D to LOS E or worse and there is a two-second or greater increase in delay; or
- A three-second or greater increase in delay at intersections operating at LOS E without and with the project; or
- Intersection operations degrade from LOS E to LOS F and there is a three-second or greater increase in delay; or
- At intersections operating at LOS F without the project, a change in the v/c ratio of greater than 0.01.

Issues Not Discussed Further

The SERC Initial Study determined that the proposed project would not affect the air traffic patterns at any of the regional airports. The project does not include activities or structures that could hinder aviation activity. This issue is not discussed further in this section.

Impact Assessment Methodology

This section presents the methodology and assumptions used to analyze traffic impacts of the proposed project. A near-term conditions analysis, which also accounts for other reasonably foreseeable near-term developments in the study area, is presented to determine if the proposed project once constructed and operational would have any near-term impacts on the surrounding transportation network.

Project Description

The proposed SERC project would be centrally located on the LBNL site in the “Old Town” area. The proposed SERC project involves development of a new three-story 40,000 gross square foot research building to accommodate approximately 60 employees, of which 40 would be relocated to the SERC facility from UC Berkeley, 10 would relocate from other locations within the LBNL hill site, and 10 new employees would be hired as a result of project implementation. The proposed project would reconfigure the existing layout of parking spaces, reducing the total amount of parking around the project site from 35 to approximately 26 spaces.
Project Trip Generation

Vehicle trip generation for the SERC project is based on trip generation rates established in the 2006 LRDP EIR. As documented in the 2006 LRDP EIR, 4,000 employees at the LBNL hill site generate 5,700 daily trips, 610 AM peak hour trips, and 660 PM peak hour trips. The SERC facility is expected to increase the daily population of the LBNL hill site by about 50 employees. Using these rates results in 71 new daily trips, 8 new AM peak hour trips, and 9 new PM peak hour trips. These rates were also applied to the other projects at LBNL that would be constructed in the same time frame as the proposed project and would add new employees to LBNL. Resulting daily and peak hour trip generation is presented in Table 4.8-4, Project Vehicle Trip Generation.

### Table 4.8-4
Project Vehicle Trip Generation

<table>
<thead>
<tr>
<th>Project</th>
<th>Increase in Daily LBNL Population</th>
<th>Trip Generation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td>Trip Generation Rate¹</td>
<td></td>
<td>1.42</td>
</tr>
<tr>
<td>SERC</td>
<td>50</td>
<td>71</td>
</tr>
<tr>
<td>CRT</td>
<td>135</td>
<td>192</td>
</tr>
<tr>
<td>User Test Bed Facility</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>BELLA</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Guest House</td>
<td>10</td>
<td>14</td>
</tr>
</tbody>
</table>


¹ As documented in the LBNL 2006 LRDP EIR and stated on page 4.11-4, the current 4,000 employees at the LBNL main hill campus generate 5,700 daily trips, 610 AM peak hour trips, and 660 PM peak hour trips. This corresponds to trip generation rate of 1.42 daily trips, 0.15 AM peak hour, and 0.17 PM peak hour trips per employee. The values shown were quantified as follows (5,700/4,000 =1.42), (610/4,000=0.15), (660/4,000=0.17).

While using these trip generation rates for new employees is consistent with the 2006 LRDP, this represents a conservative estimate of new trips because approximately 40 researchers of the 60 researchers associated with the proposed project would be relocating from the UC Berkeley Chemistry, Chemical Engineering, Materials Sciences and Engineering, and Physics Department buildings which are in the northeastern portion of the campus close to LBNL and these researchers may already be traveling through the affected intersections to reach their current parking areas (in addition, some of these researchers already travel to the LBNL hill site to use the Lab’s specialized research facilities). Additionally, parking at LBNL is at capacity and the SERC project eliminates approximately nine parking spaces and two of the other LBNL projects provide additional disabled parking only; therefore, it would
be reasonable to assume that few additional vehicles would be accommodated at the LBNL hill site until additional parking is constructed. However, to present a conservative analysis, vehicle trip generation based on increase in population is used.

**Near-Term Conditions**

The proposed project would be constructed and operational by 2013. Therefore, the effects of the project’s operational traffic were evaluated at the four study intersections under 2013 conditions with and without the project. Major projects completed after collection of existing condition data, currently under construction, or expected to be completed in the next few years (through 2013) would add to the traffic in the study area. The near-term projects included in this analysis are described below:

- **Underhill Parking Structure**, recently completed by UC Berkeley, provides 690 net new parking spaces in the Southside area.

- **Lower Hearst Parking Structure**, recently completed by UC Berkeley, provides 100 net new parking spaces in the Northside area.

- **Southeast Campus Integrated Projects (SCIP)** would consolidate existing parking spaces and provide 300 additional parking spaces in the southeast area of the UC Berkeley campus. About 546 parking spaces would be provided at the Maxwell Family Field Parking Structure located at Stadium Rim Way, just east of Gayley Road (McDougall 2010).

- **Computational Research and Theory (CRT) Project**, located on the west end of the LBNL site, would increase LBNL population by 135 persons (LBNL 2008).

- **User Test Bed Facility Project** would increase the LBNL hill site population by no more than 10 employees (O’Hearn 2010).

- **BELLA and Guest House Projects** would increase the LBNL hill site population by no more than 20 persons (O’Hearn 2010).

Other planned LBNL projects such as Seismic Phase 1, Seismic Phase 2, User Support Building, and Old Town Demolition would not result in an increase in the daily population at LBNL. Thus, they are not expected to add additional traffic to the roadway network. New trips generated by other UC Berkeley projects such as the Southeast Campus Improvement Project, Naval Architecture Restoration and Blum Center, Warren Hall replacement, Campbell Hall replacement, and Anna Head Housing are included in the trips associated with the parking structure projects as no additional parking would be added for these projects.

Estimated traffic generated by the near-term projects was added to the existing conditions volumes to estimate intersection volumes under Near-Term No Project conditions and is shown on **Figure 4.8-4**.
Near-Term No Project Conditions Peak Hour Traffic Volumes. Project trips generated by the SERC project were added to the Near-Term No Project traffic volumes to estimate Near-Term With Project volumes and are shown on Figure 4.8-5, Near Term With Project Conditions Peak Hour Traffic Volumes. Delay and LOS results for AM and PM peak hours under the Near-Term No Project and With Project conditions are presented in Table 4.8-5, Near-Term Conditions – Study Intersection LOS Summary.

Table 4.8-5
Near-Term Conditions – Study Intersection LOS Summary

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Control</th>
<th>Peak Hour</th>
<th>Near-Term No Project Delay (Seconds)</th>
<th>Near-Term No Project LOS</th>
<th>Near-Term With Project Delay (Seconds)</th>
<th>Near-Term With Project LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearst Avenue/Gayley Road/La Loma Avenue</td>
<td>Signalized</td>
<td>AM</td>
<td>35</td>
<td>D</td>
<td>35</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>57</td>
<td>E</td>
<td>57</td>
<td>E</td>
</tr>
<tr>
<td>Stadium Rim Way/Gayley Road</td>
<td>All-Way Stop-Controlled</td>
<td>AM</td>
<td>49</td>
<td>E</td>
<td>50</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>&gt;60 (v/c = 1.15)</td>
<td>F</td>
<td>&gt;60 (v/c = 1.16)</td>
<td>F</td>
</tr>
<tr>
<td>Bancroft Way/Piedmont Avenue</td>
<td>All-Way Stop-Controlled</td>
<td>AM</td>
<td>&gt;60 (v/c = 1.01)</td>
<td>F</td>
<td>&gt;60 (v/c = 1.02)</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>&gt;60 (v/c = 0.88)</td>
<td>F</td>
<td>&gt;60 (v/c = 0.88)</td>
<td>F</td>
</tr>
<tr>
<td>Durant Avenue/Piedmont Avenue</td>
<td>All-Way Stop-Controlled</td>
<td>AM</td>
<td>22</td>
<td>C</td>
<td>22</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>22</td>
<td>C</td>
<td>22</td>
<td>C</td>
</tr>
</tbody>
</table>


1 Signalized and all-way stop-controlled intersection delay and LOS based on average control delay per vehicle for the intersection according to the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000. For intersections operating at LOS F, the volume-to-capacity ratio (v/c) is also reported.

2 Based on the 2000 HCM methodology, the intersection would operate at LOS F during the AM peak hour and LOS D during the PM peak hour under Near-Term No Project and Near-Term With Project conditions. Based on field observations and measurements, the intersection currently operates at LOS F during both AM and PM peak hours due to the high number of pedestrian crossings, which the 2000 HCM methodology does not account for. Thus, the intersection would continue to operate at LOS F during both AM and PM peak hours under Near-Term No Project and Near-Term With Project conditions. Bold indicated an intersection operating at unacceptable LOS E or LOS F.

Mitigation Measures and Best Practices included in the Proposed Project

The following mitigation measures and best practices are required by the 2006 LRDP for the proposed project and are thus included as part of the proposed project. The University prepared a supplemental traffic analysis that was published in the Seismic Phase 2 EIR, which was certified by The Regents in July 2010. That analysis makes some revisions to LRDP EIR mitigation measures. The revised mitigation measures are presented below. The analysis presented below evaluates environmental impacts that
would result from project implementation following the application of LRDP EIR mitigation measures and best practices.

**LRDP EIR MM 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. LBNL shall contribute funding on a fairshare 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 LRDP EIR Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program.

**LRDP EIR MM 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 fairshare 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 LRDP EIR Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program.
Near-Term No Project Conditions Peak Hour Traffic Volumes

FIGURE 4.8-4

LEGEND

1 Study Intersections

XX (YY) AM (PM) Peak Hour

SOURCE: Fehr & Peers Traffic Consultants – March 2010

NOT TO SCALE

Lawrence Berkeley National Laboratory Boundary

924-007-04/10
Near-Term With Project Conditions Peak Hour Traffic Volumes

**FIGURE 4.8-5**

SOURCE: Fehr & Peers Traffic Consultants – March 2010

**NOT TO SCALE**
LRDP EIR MM TRANS-1c: LBNL shall fund and conduct a study to evaluate whether there may be feasible mitigation (with design standards acceptable to the City) 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. The LOS analyses herein used conservative assumptions so as to not underestimate potential project impacts. For example, even though the approach widths at this intersection allow drivers to maneuver past other vehicles as they near the intersection, the absence of pavement striping to delineate separate lanes dictated that the analysis conservatively assume all vehicle movements on each approach are made on a single lane. Similarly, without the certainty that standard lane widths (and adequate storage lengths) could be provided, possible improvement measures were not relied on to judge that significant impacts would be mitigated to less than significant levels. Judging the success of possible mitigation measures with a conservative standard is reasonable, but in consultation with City of Berkeley staff, the Lab will conduct a further study to reevaluate whether there may be feasible mitigation (with design standards acceptable to the City) at this intersection. That additional study will be conducted by the Lab as part of the TDM program set forth below as LRDP EIR Mitigation Measure TRANS-1d. If such mitigation is determined by Berkeley Lab to be feasible, then Berkeley Lab shall contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for the installation of the improvements.

LRDP EIR MM TRANS-1d: LBNL shall develop and implement a new 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 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 TDM program shall also include funding of a study to reevaluate the feasibility of mitigation at the Hearst and Gayley/LaLoma intersection. 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.

**LRDP EIR MM TRANS-1e:**

LBNL will work with the City of Berkeley to design and 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 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 **LRDP EIR Mitigation Measure TRANS-1d**, development and implementation of a new Transportation Demand Management Program.

**LRDP EIR MM 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 adjusted 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.

**LRDP BP 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. The Lab will work with the City of Berkeley Transportation and Public Works Departments to review the truck routes and the Construction Traffic Management Plans, as appropriate. Where construction traffic could interact with traffic from construction traffic from UC Berkeley, UC Berkeley staff would be invited to participate in these discussions between LBNL and the City.

**LRDP BP 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 AM and PM peak traffic periods (7:00 to 9:00 AM and 4:00 to 6:00 PM), if conditions demonstrate the need.

- A parking management plan for ensuring that construction worker parking results in minimal disruption to surrounding uses.

**LRDP BP 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.
LRDP MM TRANS-8: LBNL shall implement LRDP EIR 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); LRDP EIR 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); and LRDP EIR Mitigation Measure TRANS-1e (work with the City of Berkeley to design and install a signal at the Bancroft Way/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.

Project Impacts and Mitigation Measures

Potential project impacts on transportation and traffic are discussed in this section. The LBNL 2006 LRDP EIR found no significant impacts on the Congestion Management Plan (CMP) roadway system. Since the SERC project would generate fewer vehicle trips than the 2006 LRDP program and would not modify the regional roadway system, it would not exceed the LOS standards established for the CMP roadway system; thus this impact of the SERC project would be less than significant and is not evaluated further in this EIR.

SERC Impact TRANS-1: The proposed project would not cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system under the near-term conditions. (Less than Significant)

As described in the previous section, the estimated vehicle trips generated by the SERC project were added to the Near-Term No Project AM and PM peak hour intersection volumes, with the resulting Near-Term With Project condition intersection volumes shown on Figure 4.8-5. Table 4.8-5, above, summarizes the Near-Term With Project conditions weekday peak hour intersection LOS analysis results. Detailed calculation work sheets are provided in Appendix 4.8. As shown in the table, all four of the
existing study intersections would continue to operate at the same LOS as in the Near-Term No Project conditions.

The Stadium Rim Way/Gayley Road and Bancroft Way/Gayley Road intersections would continue to operate at LOS F during both AM and PM peak hours. However, the proposed project would increase volume-to-capacity ratios by 0.01 or less at these two intersections, which is below the significance threshold of a volume-to-capacity increase greater than 0.01. Thus, the proposed project would not cause a significant impact at the study intersections.

Mitigation Measure: No project-level mitigation measure is required.

SERC Impact TRANS-2: The proposed project would not result in inefficient and unsafe operations or inadequate emergency access. (No Impact)

Vehicles and pedestrians would access the SERC facility from McMillan Road and an existing service road (Medical Road). Medical Road is an existing one-lane service road that traverses the western edge of the project site, then turns east and then north, completing a loop and connecting back to McMillan Road. Truck loading would be provided at the western end of the building, and therefore delivery trucks would access the site from Medical Road. Approximately 200 linear feet of Medical Road along the west side of the proposed SERC facility would be modified to a width of at least 20 feet in order to meet current fire code requirements. The proposed SERC facility does not include any design features that has the potential to adversely affect vehicular, bicycle, or pedestrian safety. Therefore, the proposed project would not result in traffic hazards which would impact operational safety or emergency access.

Mitigation Measure: No project-level mitigation measure is required.

SERC Impact TRANS-3: The proposed SERC project would result in increases in transit ridership but would not require expanded service. (No Impact)

As previously discussed, the SERC project would generate proportionally fewer vehicle trips than estimated in the LBNL 2006 LRDP EIR due to the limited parking supply and relocation of employees from the nearby UC Berkeley campus. Thus, some employees and visitors to the site are expected to shift to transit modes (i.e., AC Transit, BART, LBNL shuttle) to commute to and from LBNL.

One of the principles of the LBNL 2006 LRDP is to encourage a higher transit mode share. LRDP Mitigation Measure TRANS-1d would implement a TDM program, which includes specific measures and strategies to encourage and accommodate higher transit use. Thus, the incremental increase in transit
demand generated by the SERC project is consistent with the LRDP principle to encourage higher transit use and the expanded TDM program is expected to encourage and accommodate the higher transit use.

The LBNL shuttles operating on site would provide transit service to the project site through existing stops on McMillan Road. It is anticipated that existing shuttle service would be able to accommodate the addition of approximately 50 daily employees at the LBNL hill site. It is expected that shuttle ridership and travel times would be monitored as part of the proposed TDM program, and shuttle service would be modified to meet the expected demand. If necessary, the expansion of the shuttle service is consistent with the 2006 LRDP strategy to improve the LBNL shuttle service.

Mitigation Measure: No project-level mitigation measure is required.

SERC Impact TRANS-4: The proposed project would not result in increased hazards to pedestrians or bicyclists or conflicts with adopted policies, plans, or programs promoting walking or bicycling. (No Impact)

As the proposed SERC project would provide fewer parking spaces than planned for in the LBNL 2006 LRDP, more employees and visitors would be encouraged to bicycle or walk to the site. Hearst Avenue, Gayley Road, Stadium Rim Road, and Centennial Drive are identified as Class 3 facilities (signed bike routes) by the City of Berkeley, and an unpaved path is provided on the south side of Centennial Drive. These facilities can be used by bicyclists and pedestrians to access the LBNL hill site. Although there are steep grades along Centennial Drive, Cyclotron Road, and McMillan Road, the LBNL shuttles are equipped with bicycle racks so that bicyclists can take the shuttle uphill and ride their bicycles downhill. The SERC facility would provide bicycle parking and showers that would further encourage bicycling and walking to the site.

The proposed project would not result in increased hazards to pedestrians or bicyclists or conflicts with adopted policies, plans, or programs promoting walking or bicycling.

Mitigation Measure: No project-level mitigation measure is required.

SERC Impact TRANS-5: The construction of the proposed project would temporarily and intermittently result in impacts on vehicles, pedestrians, or bicyclists, and parking. (Less than Significant)

Construction of the proposed project is expected to start in mid 2011 and continue through mid 2013. Construction could result in temporary impacts from truck traffic, material staging, construction worker
4.8 Transportation and Traffic

commute trips, and parking. LBNL Best Practices TRANS-6a through TRANS-6c require the contractor to meet with UC LBNL and prepare a Construction Traffic Management Plan (CTMP) to lessen the impacts of construction on traffic and parking. The CTMP must propose truck routes, limit truck traffic during peak commute period (7:00 to 9:00 AM and 4:00 to 6:00 PM), and prepare a parking management plan for construction workers. Consistent with LBNL Best Practice TRANS-6a and TRANS-6b, a CTMP would be prepared and implemented during project construction.

About 13,000 cubic yards (cy) of material would be exported in the early stages of construction due to excavation of the partial basement level. Assuming that each truck has a 12 cy capacity, the hauling of material from the SERC project would result in up to 2,170 one-way truck trips (1,085 inbound empty trucks and 1,085 outbound full trucks), using city streets. The excavation stage of the construction is expected to last about three months and, during that time, daily truck trips would be managed within LBNL limits for all construction projects. As noted earlier in this section, UC LBNL has a full-time Site Construction Coordinator to oversee and control all construction activities, including traffic to and from the LBNL hill site. The Site Construction Coordinator is responsible for administering best management practices and ensuring that construction vehicle traffic does not contribute to a substantial increase in volumes or a degradation in level of service on surrounding roadways.

Following completion of site grading activities, the construction of the SERC project is expected to generate an average of 10 construction truck trips per day between August 2011 and July 2013. All construction trucks are expected to travel to and from the site via the Blackberry Canyon Entrance on Cyclotron Road. Construction-related delivery truck trips would also be managed in accordance with LBNL truck trip limits. In compliance with the 2006 LRDP, the proposed project will implement LRDP Best Practices TRANS-6a through TRANS-6c to minimize construction traffic impacts on city streets. LBNL Best Practice TRANS-6a requires UC LBNL to work with the City of Berkeley to review truck routes and CTMP. LBNL Best Practice TRANS-6b limits truck traffic during the peak commute periods (7:00 to 9:00 AM and 4:00 to 6:00 PM) and requires the use of designated truck routes. Pursuant to LRDP Best Practice TRANS-6c, UC LBNL will manage project schedules to minimize overlap of heavy truck activity periods of its ongoing projects. The project’s impact related to construction truck traffic would be less than significant.

**Mitigation Measure**: No project-level mitigation measure is required.
4.8.5 CUMULATIVE IMPACTS

Cumulative Impact TRANS-1: The proposed project would not make a cumulatively considerable contribution to traffic impacts associated with construction of multiple projects at the LBNL hill site and UC Berkeley campus during the 2010 to 2013 construction window. (Less than Significant)

Analysis of the traffic-related impacts of constructing the proposed SERC project presented in the preceding portions of this section (SERC Impact TRANS-5) is inherently cumulative because it evaluates the impacts of traffic generated by SERC construction in combination with traffic generated by other reasonably foreseeable construction projects slated for the same timeframe. As discussed above, construction of the proposed SERC project would have a less than significant impact on traffic, evaluated at the project level, because:

- the project would adhere to LBNL Best Practices TRANS-6a through TRANS-6c, which, among other provisions, require the contractor to meet with UC LBNL and prepare a Construction Traffic Management Plan (CTMP) that must propose truck routes, limit truck traffic during peak commute periods, and establish a parking management plan for construction workers;

- during site grading (the peak traffic period associated with project construction), daily truck trips would be managed within LBNL limits for all construction projects, including SERC, under the auspices of UC LBNL’s full-time Site Construction Coordinator, who is responsible for administering best management practices and ensuring that construction vehicle traffic does not contribute to a substantial increase in volumes or a degradation in level of service on surrounding roadways; and

- following completion of site grading, the construction of the SERC project is expected to generate a substantially reduced ADT, but all construction traffic would nonetheless continue to be managed consistent with UC LBNL’s Best Practices to minimize impacts on traffic flow and safety.

Construction of the proposed SERC facility could overlap in time with construction of a number of other projects under the LBNL 2006 LRDP and UC Berkeley 2020 LRDP, listed in Table 4.0-1 and described briefly following the table. Depending on the timing of peak traffic generation for each project (typically associated with project earthwork), there would be some potential for the combined construction traffic associated with multiple projects to degrade roadway and intersection LOS, particularly in the immediate vicinity of the UC Berkeley campus and LBNL hill site, where construction traffic would presumably be most concentrated. At worst, this cumulative LOS degradation could rise to the level of a significant impact. However, as identified above at the project-specific level, under UC LBNL’s Best Practices, the UC LBNL Site Construction Coordinator is responsible for managing truck trips and other construction traffic (including limiting ADT and/or limiting permissible haulage hours) such that LOS degradation is
avoided. With this practice in place, the SERC project’s incremental contribution to cumulative impacts of construction traffic on roadway and intersection function would not be cumulatively considerable.

**Mitigation Measure:** No mitigation measure is required.

**Cumulative Impact TRANS-2:** The proposed project would make a cumulatively considerable contribution to long-term traffic impacts in the project vicinity. *(Potentially Significant; Significant and Unavoidable)*

The project-level analysis of impacts on traffic and transportation presented above in this section (SERC Impact TRANS-1) is inherently cumulative because it evaluates the impacts of traffic generated by the SERC project in the context of projected regional traffic conditions in the near term (2013-14), and regional traffic conditions assumed in the analysis include traffic associated with other reasonably foreseeable near-term projects. That analysis shows that the small number of peak hour vehicle trips added by the proposed project (about 8 to 9 peak hour trips) would not result in a significant near-term cumulative impact on intersection operations.

An analysis of the cumulative effect of LBNL growth under the 2006 LRDP through 2025 was included in the 2006 LRDP EIR. As noted earlier in this section, a supplemental traffic analysis was conducted in July 2010 to update the cumulative traffic impacts of the 2006 LRDP in light of the revised level of service thresholds adopted by the City of Berkeley. That additional analysis, which was presented in the Seismic Phase 2 EIR (available online at http://www.lbl.gov/Community/env-rev-docs.html), found significant and unavoidable long-term cumulative impacts at four intersections as a result of LDRP projects, including SERC, in combination with traffic generated by other reasonably foreseeable development in the area. The four affected intersections are:

- Durant Avenue/Piedmont Avenue,
- Hearst Avenue/Gayley Road–La Loma Avenue,
- Gayley Road/Stadium Rim Way, and
- Bancroft Way/Piedmont Avenue.\(^3\)

As noted earlier in this section, baseline and cumulative conditions have not experienced a meaningful change since preparation of the July 2010 supplemental traffic analysis and the cumulative projects which

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\(^3\) The key difference between the findings of the LBNL 2006 LRDP EIR and those of the Seismic Phase 2 EIR was the finding of a significant and unavoidable cumulative impact on a fourth intersection (Bancroft Way/Piedmont Avenue); the other three intersections were identified as subject to a significant and unavoidable long-term cumulative impact in the 2006 LRDP EIR.
were included in the July 2010 supplemental traffic analysis include all of the cumulative projects which this SERC project EIR looks at. Therefore, the conclusions of the LRDP EIR analysis as updated by the July 2010 study remain unchanged.

Through the 2006 LRDP EIR and approvals process, UC LBNL committed to working with the City of Berkeley and UC Berkeley to implement improvements at the three intersections identified in LRDP EIR Mitigation Measures TRANS-1a through 1c. This included conducting a detailed study at the Hearst Avenue/Gayley Road–La Loma Avenue intersection and contributing on a fair-share basis to the cost of implementing any specific mitigation measures identified through the study. The study was completed in November 2009 and identified a number of improvements that, taken together, would be sufficient to improve year 2025 LOS from F to E. UC LBNL has committed to its share of the necessary funding, but as of the preparation of this EIR, no improvements plan has been adopted by the City of Berkeley. Cumulative impacts on LOS at the Hearst Avenue/Gayley Road–La Loma Avenue intersection were therefore identified as significant and unavoidable in both the 2006 LRDP EIR and in the supplemental analysis. A similar condition pertains for the other two intersections identified in the 2006 LRDP EIR and supplemental analysis as impacted—improvements have been identified and UC LBNL has committed to fair-share funding, but since improvement plans have yet to be adopted by the City, cumulative impacts at the Durant Avenue/Piedmont Avenue and Gayley Road/Stadium Rim Way intersections are considered significant and unavoidable. The supplemental traffic analysis identified improvements to mitigate the significant long-term cumulative impact on LOS at the Bancroft Way/Piedmont Avenue intersection (LRDP EIR Mitigation Measure TRANS-1e). However, because neither UC Berkeley nor the City has a funding commitment or an improvement plan in place at this time for this intersection, this impact was evaluated as significant and unavoidable in the Seismic Phase 2 EIR.

The SERC project’s long-term operational traffic contribution to all four of these identified impacts would be comparatively small, but is nonetheless conservatively evaluated as cumulatively considerable. It would be effectively mitigated through implementation of LRDP EIR Mitigation Measures TRANS-1a through 1e, which are included in the proposed project. However, although it has committed to appropriate, fair-share mitigation for the four affected intersections, UC LBNL alone cannot implement the improvements prescribed in these mitigation measures. This mitigation requires participation and fair-share funding from UC Berkeley and the City of Berkeley as well. Until such time that those other entities were to commit to the mitigation-prescribed improvements and participate with UC LBNL in advancing an implementation plan, this CEQA analysis assumes that the SERC project’s contribution to this impact would be cumulatively considerable.

Mitigation Measure: No additional mitigation is feasible.
4.8.5 REFERENCES


