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.

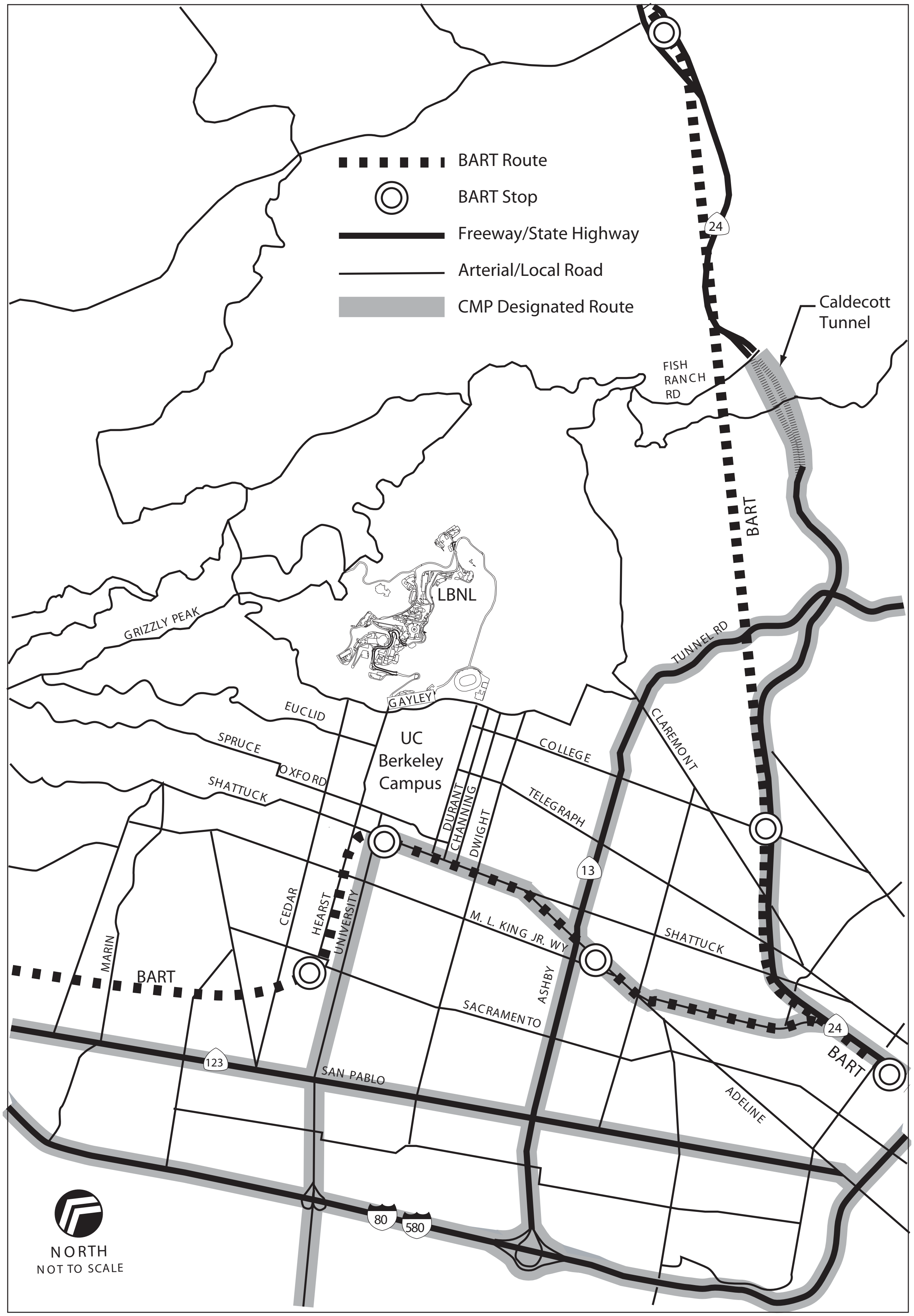
IV.L.2.1 Regional Roadways and Routes into Berkeley

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

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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

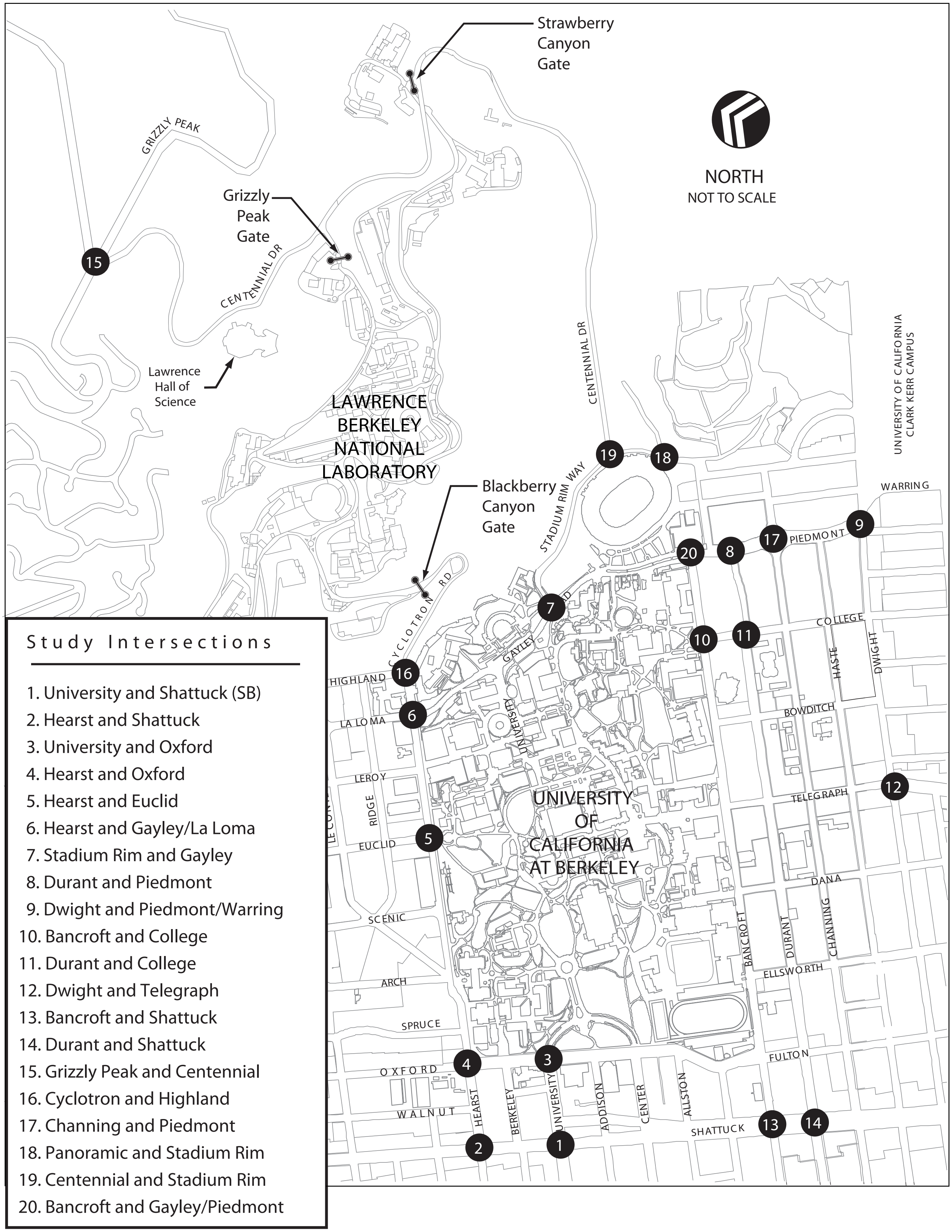
LBNL Trip Generation

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.



SOURCE: Wilbur Smith Associates

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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

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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]

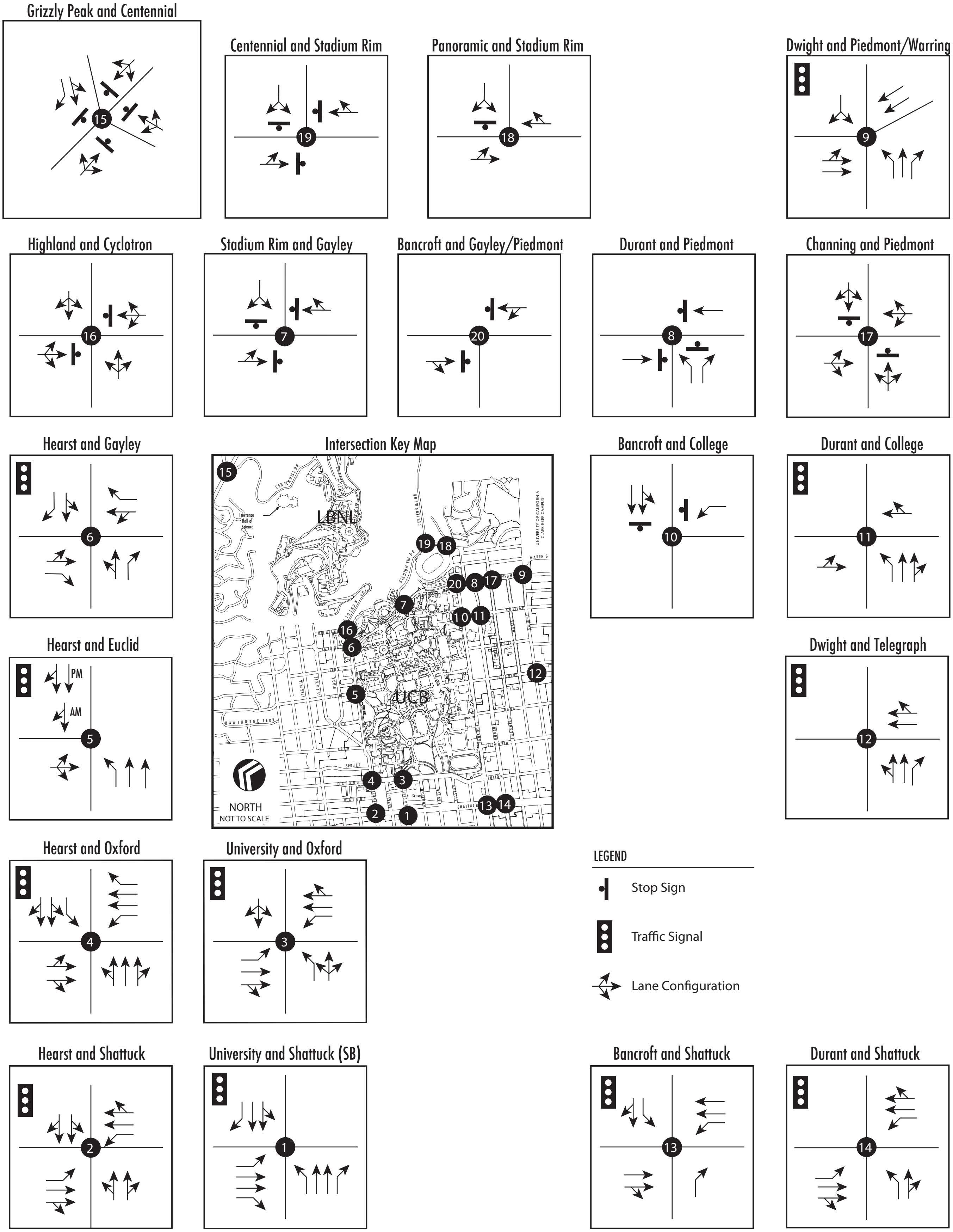
[a] A T-intersection is analyzed as a two-way stop intersection although only one leg (the "stem" of the T) is stop-controlled.
[b] Traffic approaches this intersection only on two of the three streets (Gayley and Piedmont); Bancroft is one-way westbound (outbound) from the intersection.

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.

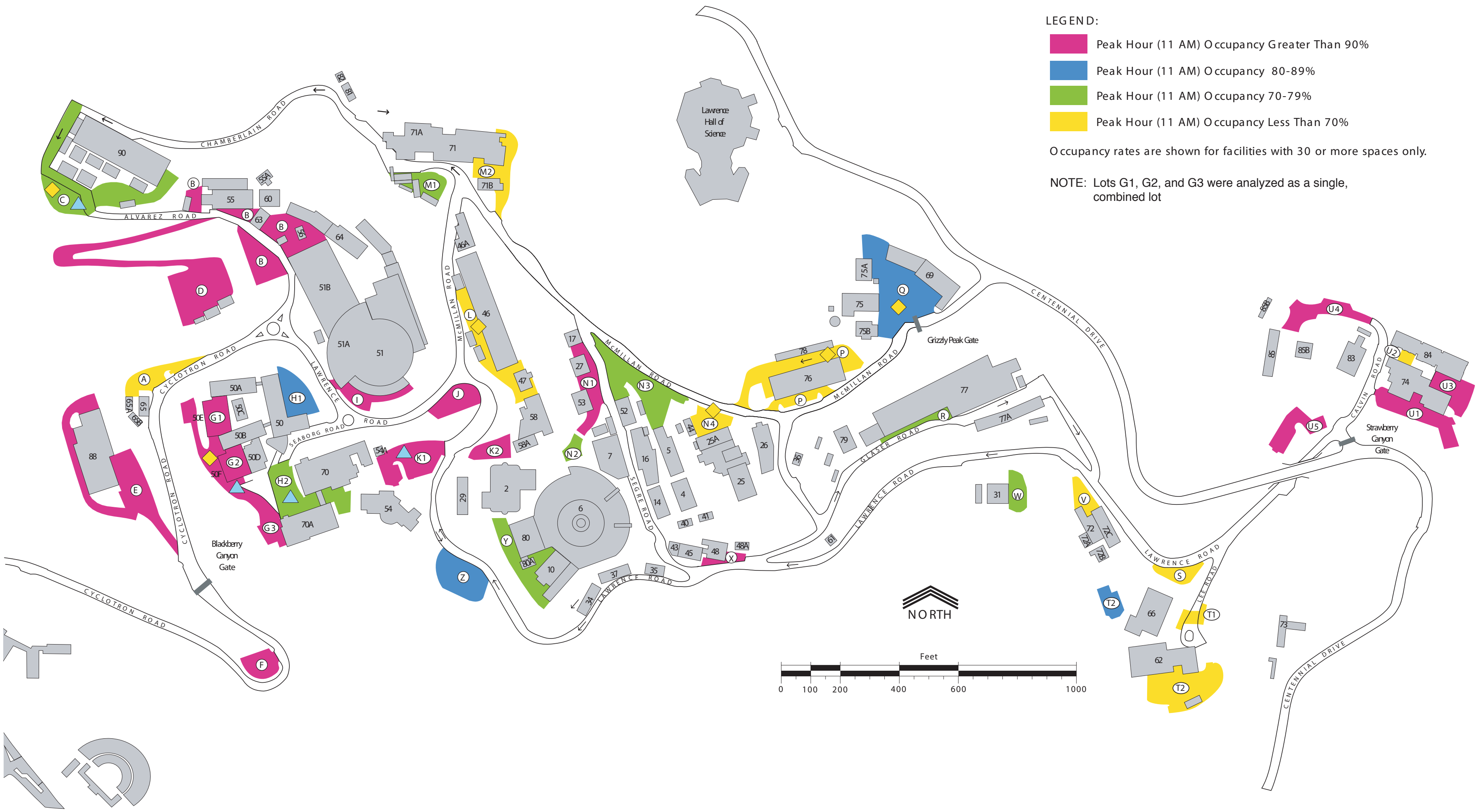
In 1999, nine of the total 36 lots were observed to be over the 90-percent occupancy threshold; in 2003, 14 lots were over the threshold. Although there is a substantial amount of unused parking on the LBNL site, it is scattered, and numerous locations are above practical capacity. In the 2003 survey 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

Figure IV.L-4
Parking Supply Map

SOURCES: Wilbur Smith Associates



SOURCES: Wilbur Smith Associates

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.

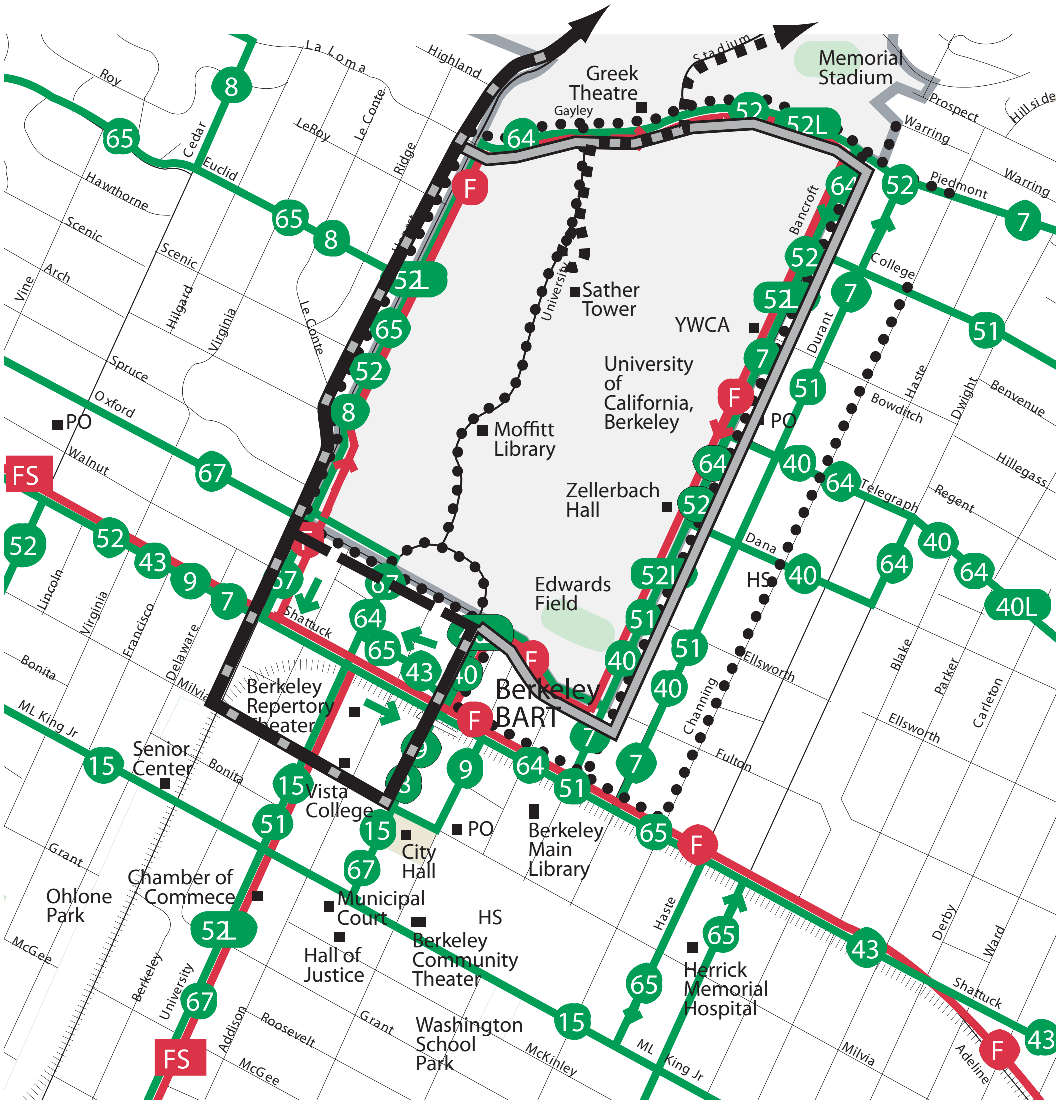
Public Transit Services

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



LBNL Offsite Shuttle - Hearst Route

LBNL Offsite Shuttle - Bancroft Route

UC Campus Hill/Strawberry Route

BART System

UC Berkeley Shuttle

AC Transit Bus Routes and Line Numbers

NORTH
NOT TO SCALE

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]

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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

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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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