4.10 Population and Housing

4.10.1 Introduction

This section evaluates the potential population and housing impacts from the proposed Computational Research and Theory (CRT) project. Information presented in the discussion and subsequent analysis was drawn from site visits, census data, estimates prepared by the State of California Department of Finance, and the City of Berkeley, city and regional projections prepared by the Association of Bay Area Governments (ABAG).

No scoping comments related to population and housing were received in response to the Notice of Preparation circulated for this EIR.

4.10.2 Environmental Setting

Regional Population

There were approximately 7.1 million people living in the nine-county Bay Area region in 2005. The region's population grew at a compound rate of 1.2 percent per year from 1990 to 2000. The Bay Area also experienced substantial increases in employment opportunities in the 1990s. The number of jobs increased at a compound rate of 1.6 percent per year, growing to a total of 3.4 million jobs in the nine-county region in 2005 (ABAG 2007)

Projections prepared by ABAG in June 2007 reflecting a "smart growth forecast" for the Bay Area show regional population growth of almost 2.2 million and an increase of about 800,000 households for the 2000 through 2035 period. For the region as a whole, the projection is for growth of over 30 percent over levels in 2000. In a departure from previous trend-based forecasts, this population and housing scenario reflects a "smart growth" vision: emphasizing infill development to revitalize central cities, support and enhance public transit, and preserve open space and agricultural land. The smart growth scenario assumes that local policies and regulations that currently limit this type of development are changed and that there is significant public investment on a regional and local level in infrastructure and in housing to achieve higher levels of housing production, and particularly high density housing near transit. The "smart growth" scenario illustrates a development pattern that, over the long term, assumes central Bay Area locations such as San Francisco, Berkeley, Oakland, Emeryville, Alameda, Fremont, Union City, Albany, El Cerrito, and Richmond absorb more housing production and population growth than would otherwise be the case. Regionally and locally, the scenario has implicit benefits in an improved balance of jobs and housing, less in-commuting, and more efficient development patterns that preserve open space and agricultural land (ABAG 2007).

Population and household growth for Berkeley and Albany represent about 1 percent of the total population and household growth forecast for the Bay Area region. Population growth is expected to continue in the city of Berkeley, building on the trends of the 1990s. The "smart growth forecast" shows an increase of over 13,000 people in the city of Berkeley between 2000 and 2025 (a 13 percent increase over 2000 levels) and an increase of almost 5,000 households in the city (an 11 percent increase over that same period). Using the adjusted 2000 population count for the city of Berkeley as a base, the total population living in the city could reach 119,700 by 2025. In Albany, population is forecast to increase by 14 percent to a total of 18,700 people in 2025. The forecast shows an additional 850 households in Albany between 2000 and 2025, an increase of 12 percent over the period (ABAG 2007).

LBNL Population

In 2003, there were 3,800 people employed by the Berkeley Lab. Most of these employees (56 percent) were full-time employees in scientific and technical positions. Administrative support positions accounted for 16 percent of the Berkeley Lab employment. Faculty (7 percent of the total), and postdoctoral researchers (6 percent of the total), as well as undergraduate and graduate students (combined representing 15 percent of the total) were also counted among the Berkeley Lab's employees (LBNL 2007).

In 2003, over the course of the year, a total of about 2,500 people used Berkeley Lab facilities as guests. Guests include industry and government researchers working at the Berkeley Lab for short-term assignments, scientists visiting from other academic institutions, or people from other institutions such as UC Davis who use Lab facilities regularly over a period of weeks or months. On an average day, 40 percent of total annual guests use Berkeley Lab facilities. In 2003, this represented about 1,000 people on any given day. Lawrence Berkeley National Laboratory (LBNL) estimates an adjusted total daily population of 4,375 people for 2003, counting both employees and guests; of the total, 3,650 adjusted daily population (ADP) are on the Berkeley Lab's main site on any given day (LBNL 2007).[1]

LBNL employees and their dependents represented 2.0 percent of the Berkeley and Albany population in 2003. In all other residential locations, Lab employees and their dependents accounted for less than one percent of the total population. Lab employees and their dependents represented 0.3 percent of the total population of Emeryville, Oakland and Piedmont; 0.6 percent of the total population of El Cerrito, Richmond, and San Pablo; and 0.7 percent of the total population of Lafayette, Moraga, and Orinda. For the Bay Area region as a whole, Lab employees and the other members of their households represented 0.1 percent of total regional population in 2003 (LBNL 2007).

1 The LBNL estimate of adjusted daily population (ADP) is defined to include FTE employment plus 40 percent of total annual guests.

4.10.3 Regulatory Considerations

Local Plans and Policies

The proposed project would be located at LBNL, which is operated by the University of California and conducts work within the University's mission on land that is owned or controlled by The Regents of the University of California. As a state entity, the University is exempted by the state constitution from compliance with local land use regulations, including general plans and zoning. However, the University seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. LBNL is located in both the city of Berkeley and the city of Oakland. The following sections summarize policies from the City of Berkeley and City of Oakland General Plans that relate to population and housing.

City of Berkeley General Plan

The City of Berkeley Draft General Plan was published in October 2000 and on December 18, 2001, the Berkeley City Council certified the General Plan EIR and approved the Housing, Land Use, and Transportation Elements. In spring 2002, the City Council approved the six remaining elements of the General Plan.

The Housing Element expresses a key local policy objective related to population and housing impacts (LBNL 2007).

> The University of California and other institutions should take responsibility for housing demands they generate which create additional pressure on the private housing market in Berkeley. By doing so, they would help avoid causing or increasing housing problems for other Berkeley residents. The City will work with the University and other State institutions to create new housing and jointly address housing issues of mutual concern (LBNL 2007).

Specific policies and actions addressing this relationship with other institutions are as follows:

> Policy H-33 University of California: Urge the University of California to maximize the supply of appropriately located, affordable housing for its students, and also to expand housing opportunities for faculty and staff.
>
> Policy H-34 Group Quarters: Support and encourage construction of group housing near the University for student housing.
>
> Policy H-35 University Housing and Taxes: Support development of new housing for University-related households and other institutions that will not take additional land off tax rolls. If that is

not possible, seek compensation for loss of revenue; seek agreement from the State of California, the University, and other institutions to compensate the City of Berkeley for services provided; and encourage that developments provide community facilities for both students and other residents.

Policy H-35 University Housing and Displacement: Support University-related housing that avoids displacement of existing residents of a loss of existing rental housing resources available to other city residents.

A related Land Use Element policy also addresses University housing:

Policy LU-37 University Housing: Encourage the University to maximize the supply of housing for students, faculty, and staff to minimize the impacts of the University on the citywide supply of housing.

City of Oakland General Plan

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

Policy N2.3 Supporting Institutional Facilities: The City should support many uses occurring in institutional facilities where they are compatible with surrounding activities and where the facility site adequately supports the proposed uses.

Policy N2.5 Balancing City and Local Benefits of Institutions: When reviewing land use permit applications for the establishment or expansion of institutional uses, the decision-making body should take into account the institution's overall benefit to the entire Oakland community, as well as its effects upon the immediately surrounding area.

Policy N2.8 Long Range Development Planning: Require, where legally allowed, and encourage in all other situations, those institutions designated with the "Institutional" land use classification should be required to present Long Range Operation and Development Plans to the City Planning Commission. While these plans could be binding or non-binding, they should present realistic information regarding the continued operation and/or expansion of the facilities. The City suggests that substantial public input be built into the process of developing the plans. The plans could be required as a part of the development applications, or on a periodic basis.

4.10.4 Impacts and Mitigation Measures

Significance Criteria

The impact of the proposed project on population and housing would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the CEQA Guidelines and the UC CEQA Handbook:

- Induce substantial population growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);
- Displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Issues Not Discussed Further

The CRT facility Initial Study found that implementation of the proposed project would not displace any existing housing or people, which would necessitate the construction of replacement housing elsewhere. The proposed project does not include housing or long-term residential uses and no housing or individuals would be displaced as a result of its implementation.

Project Impacts and Mitigation Measures

CRT Impact POP-1: The proposed project would not induce substantial population growth in an area, either directly or indirectly. (Less than Significant)

The proposed project does not include residential uses, and would not involve an extension of other infrastructure such as water and sanitary sewer that could indirectly induce substantial population growth. The proposed project would generate incidental, short-term construction employment that would create an undetermined number of new jobs. Operation of the proposed CRT facility would accommodate approximately 300 employees, of which approximately 225 would be LBNL staff and 75 would be UC Berkeley staff and students. Of the approximately 225 LBNL staff, about 135 would be existing staff relocated from the adjacent Building 50 Complex, 70 would be relocated from the off-site Oakland Scientific Facility, and approximately 20 staff would be new or relocated LBNL staff. The CRT facility would therefore add up to approximately 165 additional staff and students to the Lab site. The increase in new employees and students due to the proposed project would add new persons to the Bay Area. Assuming conservatively that each new person associated with the CRT project does not reside

within the nine County Bay Area at the time he/she begins working in the proposed facility and each such person decides to relocate into the Bay Area to be close to the CRT facility, 165 new persons would not add substantially to the total population of the Bay Area and would represent 0.0023 percent of the Bay Area's 2005 population as estimated by ABAG.

The population added by the project to any individual city within the Bay Area would be even a smaller percentage. Based on current residential trends for LBNL employees, approximately 35 percent (58) of the new staff would be Berkeley residents and approximately 14 percent (23) would be Oakland residents (LBNL 2007). These new persons would not add substantially to the total population of Berkeley or Oakland, and the population added by the project to any other individual city within the Bay Area would likely be even a smaller percentage of the new persons. Therefore, the proposed project would not induce a substantial population growth, either directly or indirectly in the project region and its impact with respect to this criterion is considered less than significant.

Mitigation Measure: No project-level mitigation measure required.

4.10.5 References

Association of Bay Area Governments. 2007. ABAG Projections 2007. June http://www.abag.ca.gov/planning/currentfcst/regional.html

City of Berkeley. 2001. General Plan Housing Element Appendix.

Lawrence Berkeley National Laboratory. 2007. 2006 Long Range Development Plan Final Environmental Impact Report. SCH No. 2000102046. July.

4.11 Public Services

4.11.1 Introduction

This section evaluates the environmental effects associated with any improvements required to meet increases in demand for public services, including fire protection, police, schools, and parks as a result of implementation of the proposed Computational Research and Theory (CRT) project. Information presented in the discussion and subsequent analysis was drawn from site visits and personal communication with Lawrence Berkeley National Laboratory (LBNL) staff.

No scoping comments related to public services were received in response to the Notice of Preparation circulated for this EIR.

4.11.2 Environmental Setting

Fire Protection

The Alameda County Fire Department (ACFD) works under contract to LBNL to provide firefighting services. This includes staffing the Berkeley Lab fire station (Station 19) on a continuous basis. The Lab's contract with ACFD requires that ACFD provide LBNL with an engine company staffed by four firefighters. Three of these firefighters must be Hazardous Materials Emergency Response (HAZMAT) certified firefighters and one is a paramedic. Equipment at Station 19, which is located in LBNL Building 48, includes one fire engine, one reserve fire engine, a hazardous materials vehicle, and a light-duty four-wheel drive "brush patrol unit" that can be used for wildland fires. Following an Automatic Aid Agreement between LBNL and the City of Berkeley, Station 19 is the designated first responder to calls within Berkeley Lab, portions of the UC Berkeley campus and portions of North Berkeley. This first response area includes the CRT project site. Approximately 25 percent of responses from Station 19 are to locations at the Berkeley Lab, about 40 percent of the calls are to the UC Berkeley campus, and the remaining calls are to locations within the city of Berkeley outside either LBNL or the Berkeley campus (LBNL 2003a).[1]

AFCD provides emergency response services to the Berkeley Lab site, augmented by Berkeley Fire Department following the Automatic Aid Agreement. The Berkeley Fire Department provides paramedic transport for LBNL; therefore, if a patient in a medical emergency requires transport to a hospital, a City of Berkeley ambulance responds at the Lab. ACFD has a continuously staffed HAZMAT response vehicle

[1] While this analysis represents 2003 baseline data, more recent data are available: In 2005, with 578 total calls, Station 19 responded to 162 (28%) Berkeley Lab calls, 130 (23%) UC Berkeley campus calls, and 286 (49%) City of Berkeley calls (LBNL 2007).

located in San Leandro that is available for larger HAZMAT incidents. HAZMAT automatic aid is also available through the County's Mutual Aid Agreement, including Berkeley Fire Department resources. An annual HAZMAT exercise is conducted with the appropriate LBNL staff and ACFD. Additionally, the Berkeley Lab has an "around-the-clock" contract with a private vendor for HAZMAT clean-up.

The Berkeley Lab's Master Emergency Program Plan (MEPP) establishes policies, procedures and an organizational structure for responding to and recovering from a major disaster at LBNL. The LBNL MEPP uses the Standardized Emergency Management System (SEMS), as described by California Government Code 8607(a), for managing response to multi-agency and multi-jurisdiction emergencies in California. This plan also uses the National Incident Management System (NIMS), as prescribed by Homeland Security Presidential Directive-5 – Management of Domestic Incidents. NIMS is a nationwide, standardized approach to incident management and response that establishes a single, comprehensive system for incident management and cooperation among departments and agencies at all levels of government, from federal to local.

Law Enforcement

Police services at LBNL are provided through a contract with the UC Berkeley Police Department (UCPD), as well as with a private security provider responsible for outside security needs including Laboratory access, property protection, and traffic control. The UCPD handles all patrol, investigation, and related law enforcement duties for UC Berkeley, LBNL, and other University-owned properties. UCPD operates 24 hours a day, seven days a week, coordinating closely with the City of Berkeley Police Department. UCPD and the Oakland Police Department are members of the California Law Enforcement Master Mutual Aid Plan; all law enforcement agencies in the state belong to this plan to provide each other information and resources when needed. Additionally, the Berkeley Lab has an annual renewable contract with UCPD that provides, when requested, law enforcement emergency response, limited patrols, criminal investigations, and VIP protection. UCPD and the Berkeley Police Department have an agreement regarding jurisdiction over off-site locations occupied by UC staff and Lab staff; this agreement is reviewed and updated annually. The Berkeley Lab does not have an agreement with Oakland Police Department.

LBNL is protected by a perimeter fence that provides access through vehicle entrance points, hardware lock-and-key sets at critical doors, and by an electronic system pre-coded to permit entry only to authorized card holders. Vehicular access onto the LBNL site is controlled by security personnel at the three vehicle entrance gates who visually inspect entering vehicles.

UC Berkeley Police Department Staffing

UCPD includes 77 police officers, 45 full-time non-sworn personnel, and 60 student employees. The UCPD building is located at 1 Sproul Hall on the UC Berkeley campus. UCPD has primary law enforcement jurisdiction on the campus and associated University properties, including LBNL. UCPD is organized into four divisions: Administration, Community Outreach and Emergency Services, Investigative and Support Services, and Patrol. When services are requested or required, UCPD sends the appropriate resources to the Berkeley Lab to address the situation and/or incident.

On-Site Security Staffing

The LBNL on-site security staff consists of approximately 34 personnel who are divided into 3 to 10 personnel per shift. Staffing and resources consist of an on-site portfolio manager, two to three roving patrols 24 hours per day and gate access at the Blackberry Canyon Gate 24 hours per day. The LBNL on-site security can respond to any accessible area of LBNL in less than five minutes. UCPD responds to LBNL as needed under the existing contract. The response time for UCPD is also less than five minutes (LBNL 2003b).

Schools

The Berkeley Unified School District (BUSD) and Oakland Unified School District (OUSD) provide public elementary and secondary school services to school-aged dependents of LBNL personnel who live in these two communities.

Parks and Recreation

The East Bay Regional Park District (EBRPD) manages over 95,000 acres within Alameda and Contra Costa counties, including 65 regional parks, recreational areas, wilderness, shorelines, preserves, and land bank areas. The EBRPD regional park properties within the vicinity of the LBNL site include Tilden Park and the Claremont Canyon Preserve.

UC Berkeley manages parks and athletic and recreational facilities that serve the University and the wider community. The University also owns the 2.3-acre People's Park located south of the UC Berkeley campus. Athletic and recreational facilities are located within the central campus and also within the Strawberry Canyon Recreation Area. Additional resources include the Ecological Study Area.

The City of Berkeley's Parks, Recreation and Waterfront Department manages the city's parks and open space. The City has 243 acres of City-owned and/or maintained parks and open space throughout Berkeley, excluding the 99-acre Aquatic Park. There are 52 parks providing traditional activities such as

athletic fields, swimming pools, and tennis and basketball courts, as well as numerous tot and school-age play areas, community gardens, rock climbing, and a variety of water sports at the Berkeley Marina. The City of Berkeley maintains the parks-to-population ratio of 2.0 acres of parkland per 1,000 persons that was established in the 1977 City of Berkeley Master Plan (City of Berkeley 2002).

The City of Oakland's Office of Parks, Recreation and Cultural Affairs manages the city's parks and recreation centers. According to the Open Space, Conservation and Recreation (OSCAR) Element of the Oakland General Plan, an estimated 3,073 acres of total parklands are available within Oakland's city limits, providing about 8.26 acres of parkland per 1,000 residents; local-serving parks provide an estimated 1.33 acres per 1,000 residents.

Project Site

The proposed project would accommodate a population of approximately 300 permanent employees, including staff and students, and involve construction of about 140,000 gross square feet (gsf) of new building space. The LBNL personnel and the new building space developed under this project would be served by public services agencies in the Cities of Berkeley and Oakland, Alameda County, and the Berkeley Lab in the manner discussed above.

4.11.3 Regulatory Considerations

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 and its proposed projects (i.e., CRT facility) seek to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible. The western part of the LBNL site is within the Berkeley city limits, and the eastern part is within the Oakland city limits. This section summarizes relevant policies contained in the 2006 LRDP, and Berkeley and Oakland General Plans.

2006 LRDP Principles and Strategies[2]

The 2006 LRDP proposes four fundamental principles that form the basis for the development strategies provided for each element of the LRDP. The principle most applicable to the public services and recreational aspect of new development is to "Build a safe, efficient, cost effective scientific infrastructure capable of long-term support of evolving scientific missions."

Development strategies provided by the 2006 LRDP are intended to minimize potential environmental impacts that could result from implementation of the 2006 LRDP. Development strategies set forth in the 2006 LRDP that are applicable to public services and recreation include the following:

- Configure and consolidate uses to improve operational efficiencies, adjacencies and ease of access;
- Increase development densities within the most developed areas of the site to preserve open space, enhance operational efficiencies and access;
- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates; and
- Develop all new landscape improvements in accordance with the Laboratory's vegetation management program to minimize the threat of wildland fire damage to facilities and personnel.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the LRDP and are proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The LBNL Design Guidelines provide specific guidelines for site planning, landscape and building design as a means to implement the LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the LRDP. The document provides the following specific planning and design guidance relevant to the public services and recreational aspects of new development:

- Provide appropriate Site Lighting for safety and security; and
- Design all new streets to accommodate two-way traffic flow and pedestrian access.

[2] While this Environmental Impact Report presents a "stand alone" impact analysis that does not rely upon tiering from any programmatic CEQA document, Berkeley Lab does actively follow the 2006 Long Range Development Plan (LRDP) as a planning guide for Lab development. Accordingly, relevant 2006 LRDP principles, strategies, and design guidelines are identified in this section.

City of Berkeley General Plan

Berkeley General Plan policies relevant to the proposed project with regard to public services include the following:

> Policy LU-15: Ensure that neighborhoods are well served by basic goods, a diverse supply of community care, services and facilities, including park, school, child care, and church facilities; fire, police, and refuse collection services; and by existing neighborhood commercial areas.

Fire Protection Services

Berkeley General Plan policies pertaining to fire protection include:

> Policy S-21 Fire Preventive Design Standards: Develop and enforce construction and design standards that ensure that new structures incorporate appropriate fire prevention features and meet current fire safety standards.
>
> *Actions:*
>
> A) Develop proposals to make developed areas more accessible to emergency vehicles and reliable for evacuation. Consider restricting on-street parking, increasing parking fines in hazardous areas, and/or undergrounding overhead utilities. Require that all private access roads be maintained by a responsible party to ensure safe and expedient passage by the Fire Department at any time, and require approval of all locking devices by the Fire Department. Ensure that all public pathways are maintained to provide safe and accessible pedestrian evacuation routes from the hill areas.
>
> B) Evaluate existing access to water supplies for fire suppression. Identify, prioritize, and implement capital improvements and acquire equipment to improve the supply and reliability of water for fire suppression. Continue to improve the water supply for fire fighting to assure peak load water supply capabilities. Continue to work with EBMUD to coordinate water supply improvements. Develop aboveground (transportable) water delivery systems.
>
> C) Provide properly staffed and equipped fire stations and engine companies. Monitor response time from initial call to arrival and pursue a response time goal of four minutes from the nearest station to all parts of the city. Construct a new hill area fire station that has wildland fire fighting equipment and ability.
>
> Policy S-22 Fire Fighting Infrastructure: Reduce fire hazard risks in existing developed areas.
>
> Policy S-23 Property Maintenance: Reduce fire hazard risks in existing developed areas by ensuring that private property is maintained to minimize vulnerability to fire hazards

Policy S-24 Mutual Aid: Continue to fulfill legal obligations and support mutual aid efforts to coordinate fire suppression within Alameda and Contra Costa Counties, Oakland, the East Bay Regional Park District and the State of California to prevent and suppress major wild land and urban fire destruction.

Policy EM-31 Landscaping: Encourage drought-resistant, rodent-resistant, and fire-resistant plants to reduce water use, prevent erosion of soils, improve habitat, lessen fire danger, and minimize degradation of resources.

Police Services

The Berkeley General Plan does not identify policies regarding police services.

Schools, Parks, and Recreation

Berkeley General Plan policies related to schools, parks, and recreation include:

Policy LU-40: Continue to support maximum opportunities for citizen use of libraries and recreational facilities, the maintenance of the hill lands as open space and the adoption of campus development standards and policies to conserve and enhance present open space resources.

Policy OS-4 Working with Other Agencies: Work with the Berkeley Unified School District, the University of California, the East Bay Municipal Utility District, and the East Bay Regional Park District to improve, preserve, maintain, and renovate their open space and recreation facilities.

City of Oakland General Plan

The Oakland General Plan Land Use and Transportation Element (LUTE) was approved in March 1998, and the OSCAR Element was approved in 1995 (City of Oakland 1998a and 1995). In addition to policies included in the Oakland General Plan, and listed below, the EIR for the LUTE included mitigation measures to reduce potential impacts on public services to a less than significant level. The mitigation directs the City to consider the availability of public services (police and fire protection services, park and recreation services, and schools) in the affected areas as well as the project's impact on current service levels (City of Oakland 1998b). General Plan policies relating to public services include the following:

Fire Protection Services

Oakland General Plan policies pertaining to fire protection include:

LU Policy N13.1: The development of public facilities and staffing of safety related services, such as fire stations, should be sequenced and timed to provide a balance between land use and population growth and public services at all times. (LUTE)

Policy CO-10.2: As determined necessary by the City, require individual property owners and developers in high hazard areas to reduce fire hazards on their properties through a range of preventative measures. Landscaping and site planning in these high hazard areas should minimize future wildfire hazards. (OSCAR Element)

Police Services

Oakland General Plan policy regarding police services includes LU Policy N13.1 (see above).

Schools, Parks, and Recreation

The Oakland General Plan does not contain policies regarding schools. General Plan OSCAR Element policies related to parks and recreation include:

Policy REC-3.1: Use level of service standards of 10 acres of total parkland and 4 acres of local-serving parkland per 1,000 residents as a means of determining where unmet needs exist and prioritizing future capital investments.

Policy REC-3.2: Follow a systematic process in allocating park and recreation funds. In general, allocate the greatest expenditures to those areas with the greatest unmet needs and place a priority on projects that maximize reductions in deficiency for the amount of money spent. However, maintain the flexibility to consider such factors as site opportunities, the availability of grants or matching funds, and linkages to other kinds of projects.

Policy REC-3.3: Consider a range of factors when locating new parks or recreational facilities, including local recreational needs, projected operating and maintenance costs, budgetary constraints, surrounding land uses, citizen wishes, accessibility, the need to protect or enhance a historic resource, and site visibility.

Policy REC-4.1: Provide for ongoing, systematic maintenance of parks and recreational facilities to prevent deterioration, ensure public safety, and permit continued public use and enjoyment.

Policy REC-6.1: Promote joint use agreements and similar arrangements between the City, the Oakland Unified School District, and other public agencies to maximize the use of school and other non-park recreational facilities during non-school hours.

Policy REC-6.2: Encourage public-private partnerships as a means of providing new recreational facilities on privately-owned sites. Promote joint use partnerships with local churches, private recreational service providers, and local non-profits.

Policy REC-6.3: In areas where park deficiencies exist, pursue recreational use of open space at surplus schools, military bases, utility and watershed properties, and transmission and transportation corridors. Recreational uses in such locations should not conflict with the functional use of the property and should be compatible with prevailing environmental conditions.

Policy REC 7-1: Provide diverse recreational activities for all ages, with a progression of programs from youth to adulthood. Equitably distribute programs throughout all Oakland neighborhoods.

Policy REC-10.1: Continue to provide General Fund support for park and recreational services, acknowledging the importance of these services to the quality of life in Oakland.

Policy REC-10.2: To the extent permitted by law, require recreational needs created by future growth to be offset by resources contributed by that growth. In other words, require mandatory land dedication for large scale residential development and establish a park impact fee for smaller-scale residential development, including individual new dwelling units. Calculate the dedication or fee requirement based on a standard of 4 acres of local-serving parkland per 1,000 residents.

Policy OS-2.5: Increase the amount of urban parkland in the seven flatland planning areas, placing a priority on land in areas with limited public open space, land adjacent to existing parks, land with the potential to provide creek or shoreline access, land with historical or visual significance, land that can be acquired at no cost or reduced cost, land in areas with dense concentrations of people or workers, and land that is highly visible from major streets or adjacent to public buildings.

4.11.4 Impacts and Mitigation Measures

Significance Criteria

The impact of the proposed project on public services and recreation would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the CEQA Guidelines and the UC CEQA Handbook:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
  - Fire protection;
  - Police protection;

  - Schools; or
  - Parks or recreational facilities.

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

Project Impacts and Mitigation Measures

CRT Impact PUB-1: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives, the construction of which could cause significant environmental impacts. (Less than Significant)

Implementation of the proposed project would increase the potential need for emergency fire services. LBNL would continue its contract to ensure equipment, materials and training are sufficient to maintain fire protection service levels for the proposed project. Any small increase in the number of calls related to the implementation of the proposed project could be accommodated without additional staff or facilities. Additionally, the proposed project would be built to comply with applicable building and fire code requirements, and U.S. Department of Energy (DOE) standards, which would include, for example, the installation of automatic fire-sprinkler systems. Based on the current and expected demand for fire protection services and discussion with the ACFD (LBNL 2007), it is not anticipated that implementation of the proposed project would result in the need for new facilities, staff or equipment to provide adequate fire protection. Therefore, impacts of the proposed project with respect to new or physically altered fire protection facilities or services would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

CRT Impact PUB-2: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives, the construction of which could cause significant environmental impacts. (Less than Significant)

Construction of the proposed project and the additional staff and students associated with the proposed project would increase the potential need for police protection services. Police services are provided through the UCPD and a private on-site security firm on a contract basis. The private security firm is responsible for on-site security needs including access to the LBNL site, property protection, and traffic

control, and can respond to any road accessible area of LBNL in less than five minutes. Under the existing contract, UCPD responds to LBNL as needed, and response times for UCPD are also less than five minutes. Based on the historic average of calls (approximately 10 calls per year), implementation of the proposed project would not noticeably increase the number of calls for police services. There would be an increased demand for on-site security, which would be addressed in the contract for services between the LBNL and the private security provided, to ensure adequate police protection for the on-site population. Based on the estimated demand for police services and discussion with LBNL, it is not anticipated that implementation of the proposed project would result in the need for new facilities, staff, or equipment to provide adequate police services. Therefore, impacts of the proposed project with respect to new or physically altered police protection facilities and services would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

CRT Impact PUB-3: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered school facilities in order to maintain acceptable service ratios or other performance objectives, the construction of which could cause significant environmental impacts. (Less than Significant)

The proposed project would not develop residential uses and therefore would not directly generate new student enrollment in the BUSD or OUSD (or other school districts). However, project-related increases in employees could draw more families with school-aged children to the LBNL commute area and project-related households could relocate to the cities of Berkeley and Oakland as a result of new employment generated by implementation of the proposed project. School-aged children in these households would attend BUSD or OUSD schools.

As discussed in Section 4.10, Population and Housing, the CRT project could add up to 165 new staff and students that would be associated with the proposed project and would be "new" to the Berkeley Lab site. Based on current residential trends for LBNL employees, approximately 35 percent (58) of the new staff would be Berkeley residents and approximately 14 percent (23) would be Oakland residents (ABAG 2007). These new persons would not add substantially to the total population of Berkeley or Oakland, and the population added by the project to any other individual city within the Bay Area would likely be a smaller percentage of the new persons. It is unlikely that all 165 new persons would have children or school-aged children. Furthermore, a portion of the new employees may not relocate and would therefore not add any students to the BUSD or OUSD. It is likely that new students associated with employees of the proposed project could be accommodated in existing school facilities in the BUSD and OUSD and would not require the construction of new school sites. In addition, overall student

enrollment in elementary and secondary schools has been declining from year to year since 2001 in both the BUSD and OUSD (LBNL 2007). Therefore, it is not anticipated that implementation of the proposed project would result in the need for new or physically altered public school facilities. The proposed project would therefore have a less than significant impact on schools.

Mitigation Measure: No project-level mitigation measure required.

CRT Impact PUB-4: The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered park or recreational facilities in order to maintain acceptable service ratios or other performance objectives, the construction of which could cause significant environmental impacts. (Less than Significant)

The proposed project does not include housing development and thus would not directly generate an increase in population that could affect local park or recreational facilities. The proposed project could have indirect effects on parks and recreational facilities related to an increase in employees that could draw more residents into the area and could thus increase demand for such facilities. As discussed in Section 4.10, Population and Housing, the CRT project could add up to 165 new staff and students that would be associated with the proposed project and would be "new" to the Berkeley Lab site. Based on current residential trends for LBNL employees, approximately 35 percent (58) of the new staff would be Berkeley residents and approximately 14 percent (23) would be Oakland residents (ABAG 2007). These new persons would not add substantially to the total population of Berkeley or Oakland, and the population added by the project to any other individual city within the Bay Area would likely be a smaller percentage of the new persons. Based on the parkland ratios established by the cities of Berkeley and Oakland, the project could generate a demand for an increase of 0.3 acre of parkland in Berkeley and an increase of 0.2 acre of parkland in Oakland. The additional demand for parks and recreational facilities thus would not require the provision of significant additional parkland or recreational facilities in order to meet service ratios.

Construction of new housing is anticipated in Berkeley, Oakland, and elsewhere in the next 20 years, based on current projections by the Association of Bay Area Governments (ABAG). Projections generated by ABAG are relied upon for preparation of city and county general plans. Under the City of Berkeley and the City of Oakland planning process, planned residential uses in each city would be subject to the City's zoning ordinance and general plan policies. While significant environmental impacts from the development of parkland in urban areas are generally not anticipated, the environmental review processes of the cities of Berkeley and Oakland, and other jurisdictions, would ensure that environmental impacts associated with the development of residential projects and their demand for recreational

facilities, as well as the development of recreational facilities themselves, are mitigated to the maximum extent feasible. It would be speculative to assume that there would be significant and unavoidable impacts from the development of parks or recreation facilities in the region.

Mitigation Measure: No project-level mitigation measure required.

CRT Impact PUB-5: The proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. (Less than Significant)

As discussed under CRT Impact PUB-4 above, the proposed project could indirectly add up to 165 new residents to the Bay Area. These new residents may use regional and local parks and recreational facilities throughout the Bay Area. While employees working at the proposed project site could use City-owned recreation facilities in Berkeley and Oakland, the increase in number of users would be very small relative to existing conditions, and usage would be dispersed across facilities in other Bay Area cities where new Berkeley Lab employees may live. The proposed project's employees would also have access to facilities on the UC Berkeley campus. It is not expected that this magnitude of increased use of local or regional parks or recreational facilities would be great enough to cause substantial physical deterioration. Therefore, the project's impact with respect to this criterion is considered less than significant.

Mitigation Measure: No project-level mitigation measure required.

4.11.5 References

Association of Bay Area Governments. 2007. ABAG Projections 2007. June. <http://www.abag.ca.gov/planning/currentfcst/regional.html>

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4.12 Transportation and Traffic

4.12.1 Introduction

This section describes the existing transportation setting and analyzes the potential impacts of the proposed Computational Research and Theory Facility (CRT) Project on transportation and traffic. Information presented in the discussion and analysis below is based on the Lawrence Berkeley National Laboratory (LBNL) 2006 Long-Range Development Plan (LRDP) EIR, and other documents associated with specific LBNL projects.

In response to the Notice of Preparation circulated for this EIR, some commenters expressed concern that roadways in Strawberry Canyon, located near the project site, are already overburdened with traffic and would be more hazardous with the addition of project traffic and large construction trucks from the various projects, especially during an emergency. Other commenters expressed concern regarding the cumulative construction traffic from numerous projects proposed in this portion of the City of Berkeley. The cumulative impacts from construction and operations traffic are evaluated in this section.

4.12.2 Environmental Setting

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

Existing Roadway Network

The CRT project would be located in the western part of the LBNL site in Berkeley, California, near the Blackberry Canyon Gate. Access to the proposed project would be provided through the existing LBNL gates. Figure 4.12-1, Study Intersection Locations, Lane Configurations and Traffic Control, shows the LBNL site, the surrounding roadway system, and intersections analyzed as part of this analysis. The regional and local roadways serving the project site, as well as the internal circulation within the site are described below.

Regional Roadways

Interstate 80 (I-80) connects the San Francisco Bay Area with the Sacramento region and continues east. Within Berkeley, I-80 is oriented in a north-south direction along the western edge of the City and provides five lanes of travel in each direction. Access from I-80 to the City of Berkeley is provided through interchanges at Ashby Avenue, University Avenue, and Gilman Street. I-80 and the nearby I-80/

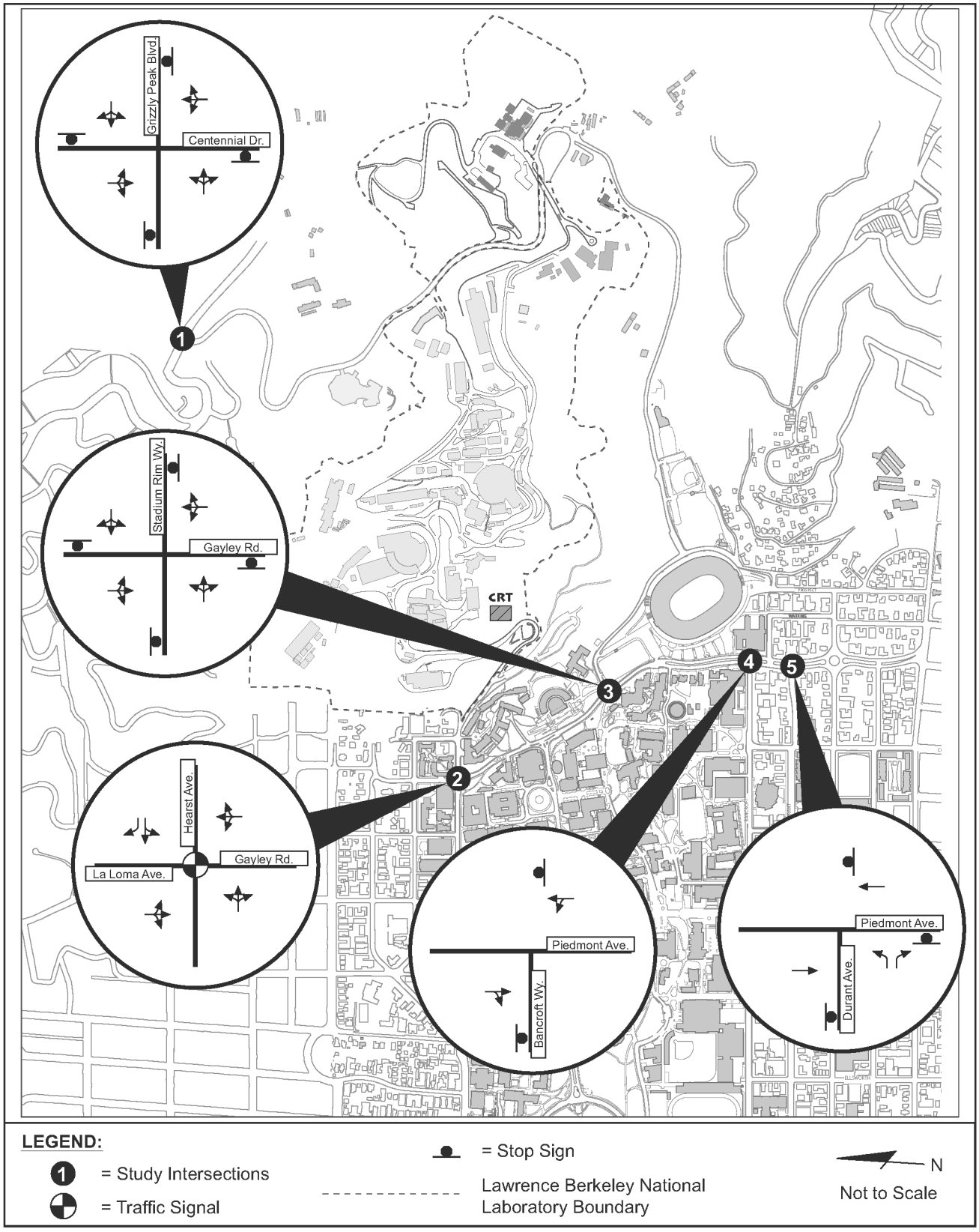
Interstate 580 (I-580) interchange operate at capacity during the peak commute hours. I-80 between Emeryville and Albany is also I-580.

State Route 24 (SR-24) links Interstate 680 (I-680) in Contra Costa County to I-80/I-580 and Interstate 980 (I-980). SR-24 provides four travel lanes in each direction near Berkeley. This is the primary route used by Berkeley-bound travelers from Contra Costa County. The primary access routes from SR-24 to the LBNL area are State Route 13 (SR-13, or Ashby Avenue) to the Belrose-Derby-Warring-Piedmont corridor, and Telegraph Avenue.

State Route 13/Ashby Avenue (SR-13) connects I-580 in east Oakland to I-80, with a partial access interchange at SR-24. In Berkeley, SR-13 is Tunnel Road/Ashby Avenue, a generally east-west two-lane arterial through the City. Ashby Avenue intersects the major north-south roadways in Berkeley, providing several routes toward LBNL and UC Berkeley campus. It is about 1.25 miles south of the Berkeley Lab. During the peak commute hours, on-street parking restrictions on the north side of Ashby Avenue in the morning and the south side in the evening provide an additional travel lane for commuters.

University Avenue provides one of Berkeley's three connections to I-80 to the west (along with Gilman Street and Ashby Avenue). It is an east-west major arterial that extends from the Berkeley Marina and I-80 in the west to the UC Berkeley campus in the east. The divided roadway provides a center median and left-turn pockets at major intersections. Left turns from University Avenue onto cross streets generally are not served by a separate left-turn signal. University Avenue is a four-lane arterial, with parallel parking provided on both sides of the roadway.

Belrose-Derby-Warring-Piedmont Corridor is a heavily traveled route connecting SR-24 with Berkeley's Southside area (i.e., the area just south of the UC Berkeley campus), UC Berkeley, and LBNL. With a single travel lane in each direction, the route is at or near capacity for several hours during the morning and evening commute periods. Using roadway signs and notices in official mailings, the City of Berkeley and UC Berkeley have been encouraging travelers to use other routes, like Telegraph Avenue.



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-1**

Study Intersection Locations, Lane Configurations and Traffic Control

Hearst Avenue is a two- to four-lane, east-west street that extends between west Berkeley and LBNL's main entrance at Cyclotron Road, which diverges from Hearst Avenue just east of Gayley Road along the northern boundary of the UC Berkeley campus. Between Gayley Road/La Loma Avenue and LeRoy Avenue, Hearst Avenue provides one travel lane in each direction, with parallel parking on both sides. During the peak commute hours, on-street parking restrictions on the south side of the street in the morning and the north side in the evening provide an additional travel lane. Hearst Avenue is designated as a bicycle lane (Class II) west of Shattuck Avenue and a bicycle route (Class III) east of Shattuck Avenue.

Local Roadways

Bancroft Way is an east-west roadway extending from downtown Berkeley through the Southside area, along the southern boundary of the UC Berkeley campus. The roadway is one-way westbound, with two travel lanes from Piedmont Avenue to Telegraph Avenue and three travel lanes from Telegraph Avenue to the Bancroft Way/Oxford Street intersection.

Durant Avenue is a major east-west roadway extending from downtown Berkeley through the Southside area. East of Shattuck Avenue, the roadway is one-way eastbound with three travel lanes. Durant Avenue serves as a one-way couplet with Bancroft Way for east-west travel on the south side of the UC Berkeley campus.

La Loma Avenue/Gayley Road is a two-lane, north-south street that extends from Hearst Avenue through north Berkeley. South of Hearst Avenue, La Loma Avenue becomes Gayley Road and borders the east side of the UC Berkeley campus. Parking is allowed on both sides of the street north of Hearst Avenue, but is not allowed south of Hearst Avenue until the vicinity of Memorial Stadium, where Gayley Road becomes Piedmont Avenue.

Stadium Rim Way wraps around the east and north sides of Memorial Stadium and connects the west end of Panoramic Way to Gayley Road near the Greek Theater. It provides access from Gayley Road and Prospect Street to the east side of Memorial Stadium and surrounding parking facilities. Stadium Rim Way also intersects with Centennial Drive, indirectly providing access to the Lawrence Hall of Science (LHS), the Botanical Garden, the Strawberry Canyon Recreational Area, and the LBNL gates on Centennial Drive. On-street parking on Stadium Rim Way is controlled by UC Berkeley. Sidewalks and poles separate pedestrian and vehicle traffic. Near the south end of Stadium Rim Way, the roadway narrows to one lane of traffic in both directions south of Canyon Road.

Centennial Drive borders the east and south perimeters of LBNL. It connects Grizzly Peak Boulevard and Stadium Rim Way and provides access to the LBNL hill site through the Strawberry Canyon and

Grizzly Peak gates. Centennial Drive also provides access to LHS, the Botanical Garden, Strawberry Canyon Recreational Area, and Tilden Regional Park. In the vicinity of LBNL, the speed limit is 25 miles per hour. Several sections of the roadway have steep grades and sharp curves, where the speed limit is reduced to 15 miles per hour.

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

Internal Circulation

The LBNL hill site is served by an east-west traffic circulation system that generally conforms to the contours of the site's topography. Employees and visitors access the site through three gates. The Blackberry Canyon Gate, on the west of the site, is accessed via Cyclotron Road and connects to Hearst Avenue. The Strawberry Canyon and Grizzly Peak gates, on the east of the site, are accessed via Centennial Drive. The three gates are attended by security personnel during business hours and accessible by a card access system at other times. The site's main vehicle routes are two-way, except for three sections where roadside parking reduces the width, permitting only one-way travel. The one-way portions are confusing for those unfamiliar with the site, and cause additional difficulties and expense for construction projects.

Traffic Operations Analysis

Intersection operations analysis during typical weekday AM and PM peak hours at the following five intersections were evaluated:

- Centennial Drive/Grizzly Peak Boulevard
- Hearst Avenue/Gayley Road/La Loma Avenue
- Stadium Rim Way/Gayley Road
- Bancroft Way/Piedmont Avenue
- Durant Avenue/Piedmont Avenue

Figure 4.12-1 shows the location of the study intersections and their configuration and control.

Intersection Operation Analysis Method

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

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

Signalized Intersection traffic conditions and resulting LOS are determined using the Highway Capacity Manual (HCM) – Special Report 209 (Transportation Research Board, 2000) method for signalized intersections. This method uses intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the control delay per vehicle. Control delay is defined as total delay attributed to signal operations and includes initial deceleration, queue move-up time, stopped delay, and acceleration delay. The LOS for a signalized intersection is based on the average control delay per vehicle for the intersection measured in seconds. Table 4.12-1, Signalized Intersection Level of Service Criteria, summarizes the LOS criteria for signalized intersections.

Unsignalized Intersections (four-way stop-controlled and side street stop-controlled) are evaluated using the HCM – Special Report 209 (Transportation Research Board, 2000) method for unsignalized intersections. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each stop-controlled movement. This incorporates delay associated with deceleration, stopping, acceleration, and moving up in the queue. However, the method does not account for additional delays caused by pedestrian crossings. For side street stop-controlled intersections, the delay is typically reported for the worst movement from the minor approaches only. Table 4.12-2, Unsignalized Intersection Level of Service Criteria, summarizes the relationship between delay and LOS for unsignalized intersections.

Table 4.12-1
Signalized Intersection Level of Service Criteria

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

Source: Highway Capacity Manual (Transportation Research Board, 2000), Chapter 16 – Signalized Intersections

Table 4.12-2
Unsignalized Intersection Level of Service Criteria

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

Source: Highway Capacity Manual (Transportation Research Board, 2000), Chapter 17 – Unsignalized Intersections

Existing Intersection Volumes

The intersection operations analysis presented in this study are based on AM and PM peak period (7:00 to 9:00 AM and 4:00 to 6:00 PM) intersection turning movement volumes collected in 2002 and used in the UC Berkeley 2020 LRDP EIR and LBNL 2006 LRDP EIR. Although more recent count data are available, the 2002 data were used because the 2002 traffic volumes are generally higher than the more recent volumes and thus would result in a more conservative analysis.[1] The reduction in traffic volumes since 2002 can be attributed to several factors including the demolition of the 300-space Underhill parking lot in 2005. However, intersection movements that would not be used by traffic associated with the Underhill parking lot were also lower in 2006. The reduction in traffic volumes can also be attributed to upstream bottlenecks metering traffic entering the study area.

Figure 4.12-2, Existing Peak Hour Traffic Volumes presents the existing AM and PM peak hour intersection volumes at the study intersections.

Existing Intersection Operations

Table 4.12-3, Existing Conditions – Study Intersection LOS Summary, summarizes existing weekday peak hour intersection LOS analysis results. Detailed calculation work sheets are provided in Appendix 4.12. As shown in the table, four of the five study intersections currently operate at LOS D or better during both AM and PM peak hours.

Based on current observations, the all-way stop-controlled Bancroft Way/Piedmont Avenue intersection operates at LOS F during both AM and PM peak hours. Northbound and southbound vehicle flows at this intersection are impeded by the high pedestrian volumes crossing Piedmont Avenue.

1 As part of the LBNL 2006 LRDP EIR, traffic data at all study intersections were collected in October 2006. In general, the 2006 total intersection volumes were lower than the 2002 volumes. Thus, the traffic analysis conducted for the LBNL 2006 LRDP EIR was based on the 2002 data because they were higher. The existing conditions traffic analysis presented in this EIR is consistent with the LBNL 2006 LRDP EIR.

Intersection turning movement data at the study intersections were also collected for the UC Berkeley Southeast Campus Integrated Projects (SCIP) EIR in January 2006. Although some movements were slightly higher in 2006, the total AM and PM peak hour intersection volumes were between three and 12 percent lower than the 2002 data.

Peak hour intersection turning movement data were also collected in April 2007 at the Bancroft Way/Piedmont Avenue and Durant Avenue/Bancroft Way intersections. Similar to the 2006 data, the 2007 total intersection volumes were also lower than the 2002 volumes.

Table 4.12-3
Existing Conditions – Study Intersection LOS Summary

Intersection	Control	AM Peak Hour Delay (Seconds)[1]	AM Peak Hour LOS[1]	PM Peak Hour Delay (Seconds)[1]	PM Peak Hour LOS[1]
Centennial Drive/ Grizzly Peak Boulevard	All-Way Stop-Controlled	10.2	B	17.7	C
Hearst Avenue/Gayley Road/ La Loma Avenue	Signalized	22.4	C	24.3	C
Stadium Rim Way/ Gayley Road	All-Way Stop-Controlled	26.2	D	34.7	D
Bancroft Way/ Piedmont Avenue[2]	All-Way Stop-Controlled	>60	F	>60	F
Durant Avenue/ Piedmont Avenue	All-Way Stop-Controlled	17.4	C	17.6	C

Source: Fehr & Peers, August 2007.

[1] Signalized and all-way stop-controlled intersection delay and LOS based on average control delay per vehicle, according to the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000.

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

Bold indicated an intersection operating at unacceptable LOS E or LOS F.

Existing Parking Conditions

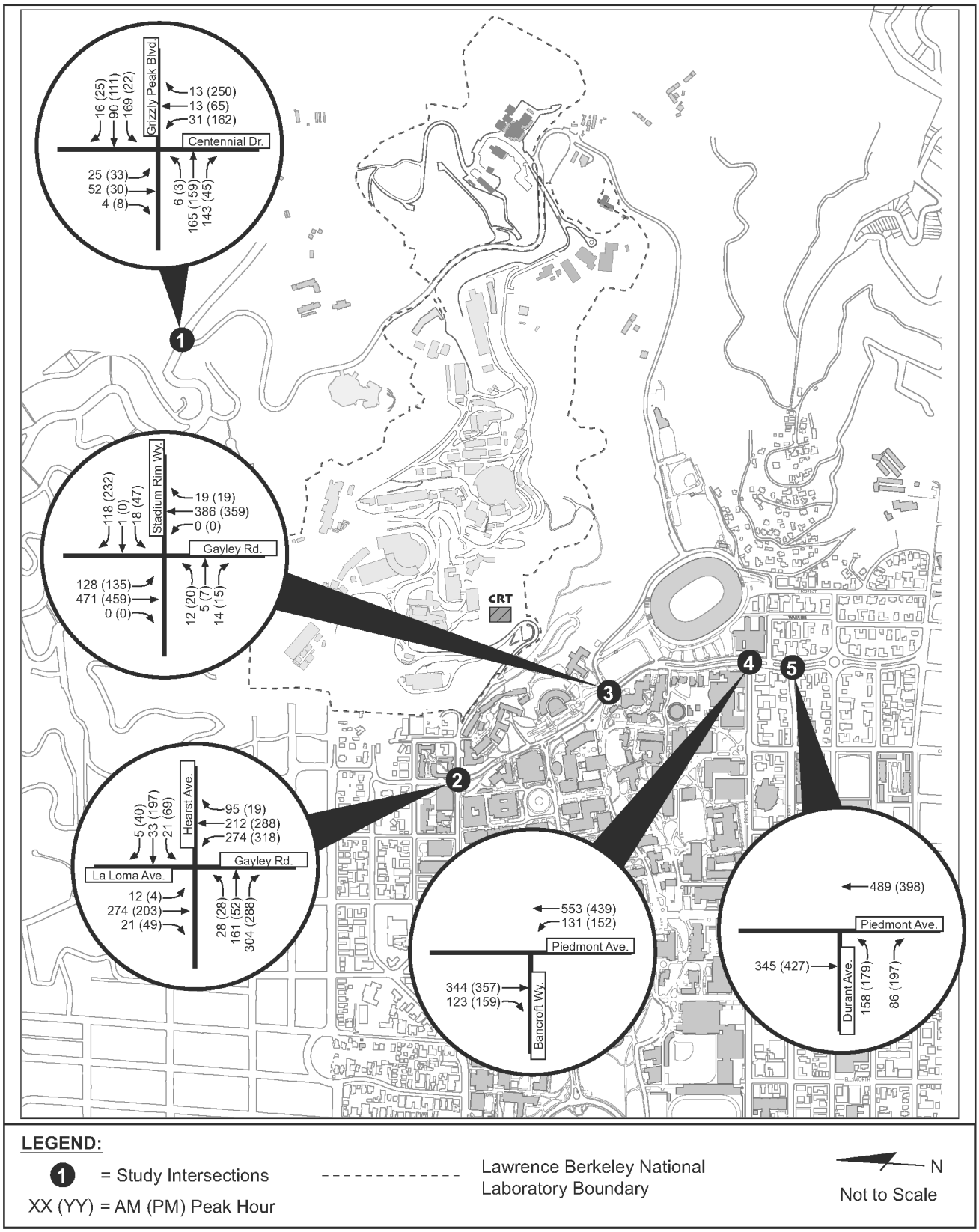
This section describes on- and off-site parking conditions.

On-Site Parking

Based on a parking inventory conducted in September 2007, about 2,160 parking spaces are provided at LBNL. The parking supply is slightly less than the parking supply of 2,300 spaces reported in the LBNL 2006 LRDP EIR due to construction staging in parts of several facilities.

The parking supply includes marked parking spaces in parking lots, on-street parking spaces, and unmarked informal parking areas. Constrained by the hilly terrain of the site, most parking lots are rather small and serve nearby buildings. Parking at LBNL is controlled by parking permits. Only site employees and regular visitors can obtain parking permits, which are provided at no cost.

Since these parking spaces are scattered through many parking lots of varying sizes, the last few spaces can be difficult to locate. Thus, the practical capacity of the entire site is considered to be 90 percent of the



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-2**

Existing Peak Hour Traffic Volumes

parking supply. Based on parking occupancy data collected in September 2007, the peak parking occupancy at the site was 81 percent of the parking supply, which is similar to the data collected in 2003 and used in the LBNL 2006 LRDP EIR. Although some parking lots were occupied at or above their "practical capacity," parking spaces were available at more remote parking lots.

Off-Site Parking

UC Berkeley provides parking facilities for its students, staff, and faculty. Although about 350 LBNL employees also work at UC Berkeley campus, few park in UC Berkeley campus facilities. This is likely because LBNL parking permits are free, whereas UC Berkeley charges for parking permits. In addition, most UC Berkeley facilities are usually occupied at or near capacity throughout the day.

There are no on-street parking spaces available on roadways providing access to the LBNL site. On-street parking on the surrounding neighborhoods are controlled by either parking meters and limited to one hour or less in non-residential streets or controlled by residential parking permits and limited to two hours for non-residents in residential streets. As a result, on-street parking is not a practical option for LBNL employees and visitors.

Existing Transit and Shuttle Services

The LBNL site is served indirectly by Bay Area Rapid Transit (BART), Alameda-Contra Costa Transit (AC Transit), and UC Berkeley Shuttle Service (BEAR Transit), and directly by the LBNL shuttle service. Figure 4.12-3, Transit Routes in Project Vicinity, shows the transit routes in the vicinity of the project site. Each transit service is described below.

BART

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

The Downtown Berkeley BART station is one of the most highly used stations within the BART system, with average weekday exits and entries for 2007 of approximately 20,200 passengers.

AC Transit

Local bus service in Berkeley is provided by AC Transit. Within the City of Berkeley, at least one AC Transit route provides service within walking distance (0.25 mile) of nearly every resident in the City. Five bus routes provide service to the project area. Figure 4.12-3 illustrates the existing AC Transit routes in the vicinity of the LBNL hill site. Although these routes do not directly serve the LBNL hill site, the LBNL shuttle service provides access to them.

The following bus routes serve the project area:

- Line 7 provides service between the El Cerrito Del Norte and Rockridge BART station and travels along Piedmont Avenue and the Bancroft Way/Durant Avenue couplet in the project area. It operates on 20- to 30-minute headways during the week between approximately 6:30 AM and 9:00 PM. On weekends, Line 7 operates with 60-minute headways between 8:00 AM and 6:00 PM.

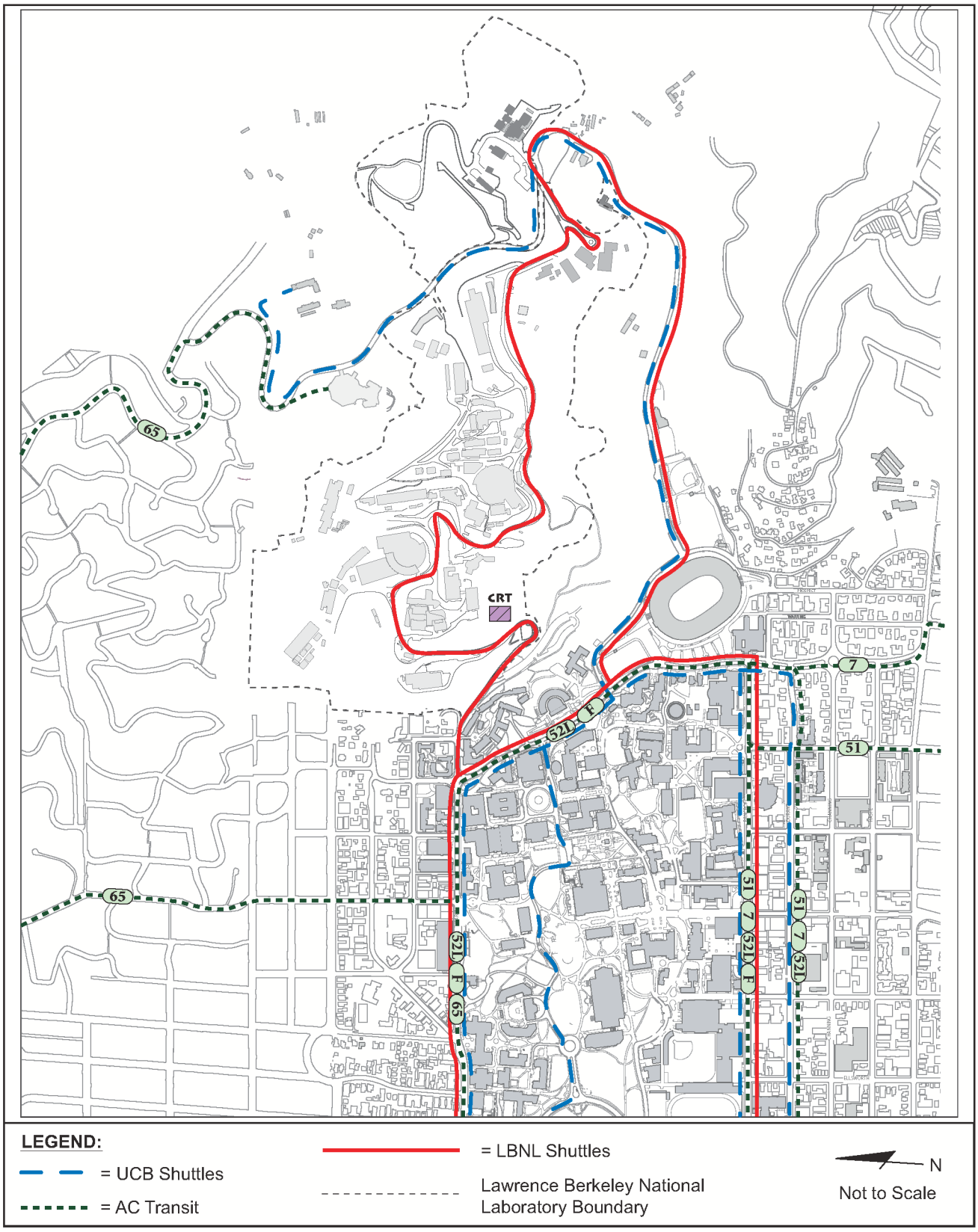
- Line 51 provides service between the Berkeley AMTRAK Station in West Berkeley and Oakland and Alameda and travels along Piedmont Avenue and the Bancroft Way/Durant Avenue couplet in the project area. It operates daily on 8- to 20-minute headways during the day and 60-minute headways through the night as Line 851.

- Line 52L provides service between the University Village in Albany and the UC Berkeley campus and travels along Gayley Road and the Bancroft Way/Durant Avenue couplet near the project site. Line 52L operates on 15- to 30-minute headways on weekdays and on 30-minute headways on weekends between 6:00 AM and midnight.

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

- The Transbay Line F provides service between the UC Berkeley campus and the Transbay Terminal in San Francisco. It operates along Gayley Road and Bancroft Way in the project area. It has 30- to 60-minute headways from 5:00 AM to 1:00 AM on weekdays and the FS line operates on approximately 30-minute headways on weekdays in the eastbound direction during the PM peak commute and in the westbound direction during the AM peak commute.

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



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-3**

Transit Routes in Project Vicinity

BEAR Transit

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

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

LBNL Shuttles

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

- The Green Route operates internally on the hill site on weekdays from 6:40 AM to 7:00 PM with 15-minute headways.
- The Orange Route operates in a counterclockwise loop between the LBNL hill site and the downtown Berkeley BART Station through Hearst Avenue and Centennial Drive on weekdays with 30-minute headways from 6:30 AM to 9:00 AM and 6:00 PM to 7:00 PM and with 15-minute headways from 9:00 AM to 6:00 PM.
- The Blue Route operates in a clockwise loop between the Downtown Berkeley BART Station, the north side of the UC Berkeley campus, the LBNL hill site, and the Southside area through Hearst Avenue, Centennial Drive, Gayley Road, and Bancroft Way on weekdays with 15-minute headways from 6:00 AM to 5:30 PM and with 30-minute headways from 5:30 PM to 7:30 PM.
- The Rockridge Shuttle operates between the LBNL hill site and the Rockridge BART Station on 1-hour headways from 6:40 AM to 9:40 AM and from 3:40 PM to 6:40 PM.

Although the LBNL shuttles are free, they are restricted to LBNL employees and visitors, and shuttle riders are required to provide valid identification to the driver. Shuttle stops are coordinated with AC Transit bus lines serving downtown Berkeley. The LBNL shuttles are equipped with bicycle racks for the ride up the hill. Shuttles listed above serve the project site via stops on Cyclotron Road near the Blackberry Canyon Gate or on Seaborg Road near Building 70.

Existing Pedestrian and Bicycle Circulation

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

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

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

4.12.3 Regulatory Considerations

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. 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 principles, polices and guidelines contained in the LBNL 2006 LRDP, and the general plans of the cities of Berkeley and Oakland.

2006 LRDP Principles and Strategies[2]

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

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

- Increase development densities within the areas corresponding to the existing clusters of development to preserve open space, enhance operational efficiencies, and access.
- Site and design new facilities in accordance with University of California Policy on Sustainable Practices to reduce energy, water and material consumption and provide improved occupant health, comfort, and productivity.
- Increase use of alternate modes of transit through improvements to the Laboratory's shuttle bus service.
- Promote transportation demand management strategies such as vanpools and employee ride share programs.
- Improve efficiency and security of Laboratory access through improvements to existing gates and the creation of new gates.
- Create a better linkage between parking, shuttle stops, and pedestrian circulation on site.
- Provide separated routes of travel wherever possible for pedestrians and vehicles.
- Promote use of bicycles by providing additional storage racks and shower facilities.
- Eliminate parking from the sides of major roadways, thereby improving safety and allowing one-way roads to be converted to two-way traffic.
- Maintain or reduce the percentage of parking spaces relative to the adjusted daily population.

[2] While this Environmental Impact Report presents a "stand alone" impact analysis that does not rely upon tiering from any programmatic CEQA document, Berkeley Lab does actively follow the 2006 LRDP as a planning guide for Lab development. Accordingly, relevant 2006 LRDP principles, strategies, and design guidelines are identified in this section.

- 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 2006 LRDP and provide specific guidelines for site planning, landscape and building design as a means to implement the 2006 LRDP's development principles as each new project is developed. Specific design guidelines are organized by a set of design objectives that essentially correspond to the strategies provided in the 2006 LRDP.

The design guidelines would be applied to the proposed project as part of the 2006 LRDP program. As part of the design review and approval process, the proposed project would be evaluated for adherence to the LRDP Land Use Map, the design guidelines, the Building Heights Map, and other relevant plans and policies. Approvals would be subject to satisfactory compliance with these provisions. Design objectives that are contained within the design guidelines and applicable to the transportation and traffic analysis include the following:

- Stimulate pedestrian activity and interaction in the Commons Spaces.
- Create as high a density and critical mass around commons spaces as possible.
- Segregate public entries and paths from service entries and paths where feasible.
- Where segregation is not possible, and service and public access overlap in accessing buildings, design service courts to intelligently serve both.

- Design Pathway Layouts that support pedestrian flow and encourage casual interaction.
- Design all new streets to accommodate two-way traffic flow and pedestrian access.
- Reduce the amount of impermeable surfaces at the Berkeley Lab.
- Minimize visual and environmental impacts of new parking lots.
- Create parking plazas to accommodate multiple functions where restricted sites do not allow for them to be segregated.
- Site and design parking structures to integrate with the natural surroundings.

City of 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 CRT project:

> Transportation Objective 1: Maintain and improve public transportation services throughout the city.
>
> Transportation Objective 2: Reduce automobile use and vehicle miles traveled in Berkeley, and the related impacts, by providing and advocating for transportation alternatives and subsidies that facilitate voluntary decisions to drive less.
>
> Transportation Objective 6: Create a model bicycle- and pedestrian-friendly city where bicycling and walking are safe, attractive, easy, and convenient forms of transportation and recreation for people of all ages and abilities.
>
> Policy T-2 Public Transportation Improvements: Encourage regional and local efforts to maintain and enhance public transportation services and seek additional regional funding for public and alternative transportation improvements.
>
> Action T-2 D: Improve shuttle and transit services by:
>
> 1. Increasing shuttle and transit services from Rockridge and the Rockridge BART station to downtown BART and the UCB campus.

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.

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-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.

City of Oakland General Plan

The following transportation-related policies in the Oakland General Plan Land Use and Transportation Element are relevant to the CRT project:

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 CRT project 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.

4.12.5 Impacts and Mitigation Measures

Significance Criteria

The impact of the proposed project on transportation and traffic would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the California Environmental Quality Act (CEQA) Guidelines and the UC CEQA Handbook:

- 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 HCM 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);[3]

[3] 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.

- 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, 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, 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).

Issues Not Discussed Further

The CRT facility Initial Study found that the project would not affect the air traffic patterns at any of the regional airports. The project does not include activities or structures that could hinder aviation activity. This issue is not discussed further.

Impact Assessment Methodology

This section presents the methodology and assumptions used to analyze traffic impacts of the project. A Near-Term conditions analysis, which also accounts for other likely near-term developments in the study area, is presented to determine if the project would have any near-term impacts on the surrounding transportation network. For long term cumulative impacts of the proposed project, see Section 5.0, Cumulative Impacts.

Project Description

The CRT project, located in the western portion of the LBNL site, would contain about 140,000 gross square feet of space. The project is estimated to increase the Adjusted Daily Population (ADP) by about 300 persons. Although some of these employees are currently at other LBNL buildings and would relocate to the new building, this analysis assumes that the 300 ADP at the CRT site would be new to the main hill site to account for potential backfill of existing spaces and present a conservative analysis.

The CRT project would also construct about four parking spaces to provide disabled access to the building and a few additional spaces for delivery and maintenance vehicles. No other LBNL parking facilities would be constructed and employees and visitors would be accommodated by the existing parking facilities. Access to and from the CRT project would be provided through existing LBNL gates.

Project Trip Generation

The LBNL 2006 LRDP EIR assumed that vehicle trips generated by the growth under the 2006 LRDP would be proportional to the estimated population increase. The LBNL 2006 LRDP also assumed that parking supply would increase in the same proportion. However, vehicle trip generation is also expected to be directly proportional to overall parking supply because the main hill site is somewhat isolated, parking supply in the vicinity of the site is limited, and parking demand at the site is controlled by the number of parking permits issued by LBNL.

Based on information provided in the LBNL 2006 LRDP EIR, LBNL provides one parking space per 1.7 ADP. As stated above, the CRT project would add parking spaces for disabled access only. The CRT project, combined with the Helios project (which would be developed simultaneously with the CRT project) would increase LBNL parking supply by 50 spaces[4] while increasing population by approximately 803 ADP. The CRT and Helios projects would need to provide 461 parking spaces to maintain the existing parking supply ratio.

Considering the practical capacity of the LBNL site, there are currently 190 parking spaces available throughout the LBNL hill site. Combined with the 50 spaces that would be added by the Helios project, 240 parking spaces would be available for the CRT and Helios projects. This is about 52 percent of the 461 parking spaces that would be needed by these two projects. Based on the limited parking supply available, the trip generation rate for the project is estimated to be 52 percent of the trip generation rates used in the LBNL 2006 LRDP EIR. The Trip Generation for Helios and CRT Memorandum, dated September 17, 2007 and included in Appendix 4.12, describes the assumptions and methodology used to estimate vehicle trip generation for the project. This analysis assumes that new vehicle trips would be directly proportional to the parking spaces available for the two projects, and individuals who are not provided parking permits for the available spaces would travel to the site by shuttle buses or other alternate modes of travel. These assumptions are reasonable given the absence of off-street and on-street parking in the vicinity of the LBNL site, the fact that permits are needed to park in UC Berkeley parking facilities, and the distance individuals would have to walk in order to access their work sites at LBNL, were they to park off site. Table 4.12-4, Project Vehicle Trip Generation, presents the resulting estimated trip

4 This does not include the four disabled parking spaces that would be constructed as part of the CRT project because they would not be available to most site employees and visitors.

generation for the CRT project. The project is estimated to generate 220 daily, 24 AM peak hour, and 25 PM peak hour trips.

Table 4.12-4
Project Vehicle Trip Generation

Scenario	Adjusted Daily Population	Trip Generation						
			AM Peak Hour			PM Peak Hour		
		Daily	In	Out	Total	In	Out	Total
Existing (2003)	4,000	5,700	540	70	610	75	585	660
LRDP	1,150[1]	1,600	150	20	170	20	160	180
CRT	303	220	21	3	24	3	22	25
Percent of LRDP	27%	13%	13%	13%	13%	13%	13%	13%
CRT and Helios	803	582	55	7	62	8	58	66
Percent of LRDP	70%	36%	36%	36%	36%	36%	36%	36%

Source: Fehr & Peers, 2007 and data presented in section IV.L of the LBNL 2006 LRDP EIR.

[1] The LRDP program has been reduced to 1,000 new ADP in 2025. However, the traffic analysis in the LBNL 2006 LRDP EIR was completed for 1,150 new ADP.

As previously mentioned, the CRT project is expected to be developed simultaneously with the Helios project. As shown in Table 4.12-4, the two projects combined would account for 36 percent of the estimated trip generation for the entire LRDP program.

As required by LRDP MM TRANS-1d, LBNL will enhance the current Transportation Demand Management (TDM) program by expanding existing measures, such as increasing the current shuttle service, and developing new measures. These measures would discourage the use of single-occupant vehicles and encourage the use of other commute modes. Since the number of vehicle trips generated by the CRT project would be limited by the available parking supply, the TDM program would be expanded as needed to reduce parking demand and meet the additional demand for alternative commute modes generated by the CRT project.

Near-Term No Project Conditions

Major projects currently under construction or expected to be completed in the next few years, (through about 2012, would add to the traffic in the study area. The Near-Term projects included in this analysis are described below:

- Underhill Parking Structure, recently completed by UC Berkeley, would provide 690 net new parking spaces in the Southside area.[5]
- Lower Hearst Parking Structure, recently completed by UC Berkeley, would provide 100 net new parking spaces in the Northside area.[6]
- Southeast Campus Integrated Projects (SCIP) would consolidate existing parking spaces and provide 300 additional parking spaces in the southeast area of UC Berkeley campus. About 900 parking spaces would be provided at the Maxwell Family Field Parking Structure located at Stadium Rim Way, just east of Gayley Road.
- Helios Energy Research Facility Project, located on the east end of the LBNL site, would increase LBNL population by 500 persons. An EIR for this project is currently under way.

Other planned LBNL projects such as the User Support Building and Guest House would not result in an increase in the Berkeley Lab's daily population. Thus, they are not expected to add additional traffic to the roadway network.

Other projects, such as the Telegraph Avenue Bus Rapid Transit (BRT) and the Southside Area Plan, are proposed for the project area. The BRT project would provide bus service on dedicated travel lanes on Telegraph Avenue between Berkeley and San Leandro. The EIR for the Telegraph Avenue BRT was released in May 2007. The BRT alignment has not been finalized and the project does not have full funding, nor has it been approved by AC Transit or other jurisdictions that it would travel through, such as the cities of Oakland or Berkeley.

The proposed Southside Area Plan would guide development in the Southside neighborhood. As part of the Southside Area Plan, modifications to the transportation circulation network are also under

5 The Underhill Parking Structure, although operational at the time of EIR preparation, is included in the Near-Term analysis as a new project because at the time traffic counts were conducted that are used in this EIR, the parking structure was smaller with only 310 parking spaces. Following construction, the parking structure now provides approximately 1,000 parking spaces. Since the Existing conditions traffic volumes include traffic associated with the 310 parking spaces that were at the parking structure site in 2002, the net new parking spaces are accounted for in the Near-Term analysis.

6 Although the Lower Hearst Parking Structure was operational at the time of EIR preparation, it is included in the Near-Term analysis as a new project because at the time that traffic counts were conducted that are used in this EIR, the parking structure had 100 fewer spaces. The 100 net new parking spaces in this parking facility are accounted for in the Near-Term analysis.

consideration. These modifications include options such as converting Bancroft Way and Durant Avenue to two-way streets, or restricting vehicular traffic on portions of Telegraph Avenue. The City of Berkeley has not approved the Southside Area Plan or any of the potential modifications to the roadway network. Since neither the BRT project nor the Southside Area Plan has been approved yet, this EIR does not account for potential modifications caused by these proposed but not approved improvements.

Estimated traffic generated by the Near-Term projects was added to the existing conditions volumes to estimate intersection volumes under Near-Term No Project conditions. Figure 4.12-4, Near-Term No Project Peak Hour Traffic Volumes presents the AM and PM peak hour intersection volumes under Near-Term No Project conditions. Table 4.12-5, Near-Term Conditions – Study Intersection LOS Summary summarizes the Near-Term No Project conditions weekday peak hour intersection LOS analysis results. Detailed calculation work sheets are provided in Appendix 4.12.

Table 4.12-5
Near-Term Conditions – Study Intersection LOS Summary

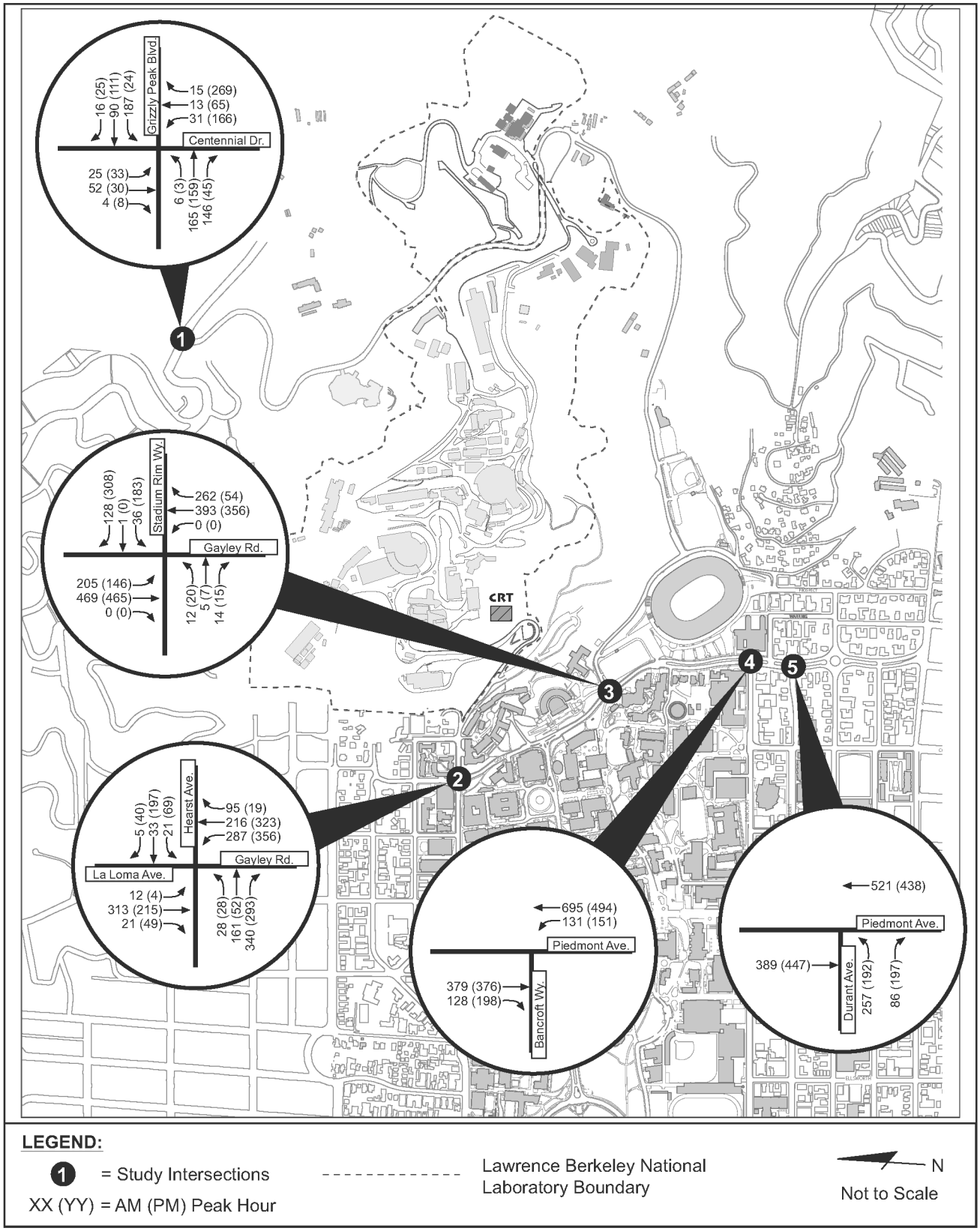
			Near-Term No Project		Near-Term With Project	
Intersection	Control	Peak Hour	Delay (Seconds)[1]	LOS [1]	Delay (Seconds) [1]	LOS [1]
Centennial Drive/	All-Way	AM	10.4	B	10.4	B
Grizzly Peak Boulevard	Stop-Controlled	PM	19.7	C	19.7	C
Hearst Avenue/Gayley	Signalized	AM	28.0	C	29.5	C
Road/La Loma Avenue		PM	41.1	D	41.0	D
Stadium Rim Way/	All-Way	AM	>60	F	>60	F
Gayley Road	Stop-Controlled	PM	>60	F	>60	F
Bancroft Way/	All-Way	AM	>60	F	>60	F
Piedmont Avenue[2]	Stop-Controlled	PM	>60	F	>60	F
Durant Avenue/	All-Way	AM	26.3	D	27.2	D
Piedmont Avenue	Stop-Controlled	PM	20.6	C	20.9	C

Source: Fehr & Peers, August 2007.

[1] Signalized and all-way stop-controlled intersection delay and LOS based on average control delay per vehicle for the intersection, and side-street stop-controlled intersection delay and LOS based on average control delay per vehicle for the worst approach, according to the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000.

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

Bold indicates an intersection operating at unacceptable LOS E or LOS F.



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-4**

Near-Term No Project Peak Hour Traffic Volumes

As shown in the table, three of the study intersections that currently operate at LOS D or better would continue to operate at LOS D or better during both AM and PM peak hours. The all-way stop-controlled Stadium Rim Way/Gayley Road intersection would degrade from LOS D under Existing conditions to LOS F under Near-Term No Project conditions during both AM and PM peak hours. The all-way stop-controlled Bancroft Way-Piedmont Avenue intersection would continue to operate at LOS F during both AM and PM peak hours, primarily due to the high pedestrian volume.[7]

Mitigation Measures included in the Proposed Project

The following mitigation measures, adopted as part of the 2006 LRDP, are required by the 2006 LRDP for the proposed project and are thus included as part of the proposed project. The analysis presented below evaluates environmental impacts that would result from project implementation following the application of these mitigation measures. These mitigation measures that are included in the project would be monitored pursuant to the Mitigation Monitoring and Reporting Plan that will be adopted for the proposed project.

LRDP MM TRANS-1a: LBNL shall work with UC Berkeley and the City of Berkeley to design and install a signal at the Gayley Road/Stadium Rim Way intersection, when a signal warrant analysis shows that the signal is needed. The intersection would meet 1-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 fairshare basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for a periodic (annual or biennial) signal warrant check to allow the City to determine when a signal is warranted, and for installation of the signal. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible measure(s). See also MM TRANS-1c, development and implementation of a new Transportation Demand Management Program.

LRDP MM TRANS-1b: LBNL shall work with the City of Berkeley to design and install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows that the signal is needed. LBNL shall contribute funding, on a fairshare

7 As required by the UC Berkeley LRDP EIR Mitigation Measures TRANS-6a and Trans-7, full signal warrant analysis was completed at the Durant Avenue/Piedmont Avenue and Bancroft Way/Piedmont Avenue intersections based on data collected in April 2007. The study results were submitted to the City of Berkeley in Summer of 2007.

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 MM TRANS-1c, development and implementation of a new Transportation Demand Management Program.

LRDP MM TRANS-1c: LBNL shall fund and conduct a study to evaluate whether there may be feasible mitigation (with design standards acceptable to the City) at the intersection of Hearst Avenue at Gayley Road/La Loma Avenue. This intersection is currently signalized, and physical geometric limitations constrain improvements within its current right-of-way. All four corners of this intersection are occupied by existing UC Berkeley facilities, including Foothill Student Housing, Cory Hall, and outdoor tennis courts, as well as the Founders' Rock. The LOS analyses herein used conservative assumptions so as to not underestimate potential project impacts. For example, even though the approach widths at this intersection allow drivers to maneuver past other vehicles as they near the intersection, the absence of pavement striping to delineate separate lanes dictated that the analysis conservatively assume all vehicle movements on each approach are made on a single lane. Similarly, without the certainty that standard lane widths (and adequate storage lengths) could be provided, possible improvement measures were not relied on to judge that significant impacts would be mitigated to less than significant levels. Judging the success of possible mitigation measures with a conservative standard is reasonable, but in consultation with City of Berkeley staff, the Lab will conduct a further study to re-evaluate whether there may be feasible mitigation (with design standards acceptable to the City) at this intersection. That additional study will be conducted by the Lab as part of the TDM program set forth below as MM TRANS-1d. If such mitigation is determined by Berkeley Lab to be feasible, then Berkeley Lab shall contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for the installation of the improvements.

LRDP MM TRANS-1d: LBNL shall develop and implement a new TDM Program to replace its existing TDM program. This enhanced TDM Program has been drafted in consultation with the City of Berkeley, and is proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The proposed TDM Program includes several implementation phases tied to the addition of parking to LBNL. The final provisions of the TDM Program may be revised as it is finally adopted but will include a TDM coordinator and transportation committee, an annual inventory of parking spaces and a gate count, a study of more aggressive TDM measures, investigation of a possible parking fee, investigation of sharing services with UC Berkeley and an alternative fuels program. The TDM program shall also include funding of a study to reevaluate the feasibility of mitigation at the Hearst and Gayley/La Loma intersection. The new draft proposed TDM Program also includes a requirement that LBNL conduct an additional traffic study to reevaluate traffic impacts on the earliest to occur of 10 years following the certification of this EIR or the time at which the Lab formally proposes a project that will bring total development of parking spaces pursuant to the 2006 LRDP to or above 375 additional parking spaces.

LRDP MM TRANS-3: LBNL shall develop and maintain a transportation plan designed to ensure that the current balance of transportation modes is maintained. This plan shall include (1) maintaining the same (or lesser) ratio of parking permits and parking spaces to ADP, and (2) ensuring that levels of shuttle bus service and provision of bike racks on shuttle buses are sufficient to accommodate projected demand.

LRDP BP TRANS-6a: Early in construction period planning, LNBL shall meet with the contractor for each construction project to describe and establish best practices for reducing construction period impacts on circulation and parking in the vicinity of the project site. The Lab will work with the City of Berkeley Transportation and Public Works Departments to review the truck routes and the Construction Traffic Management Plans, as appropriate. Where construction traffic could interact with traffic from construction traffic from UC Berkeley, UC Berkeley staff would be invited to participate in these discussions between LBNL and the City.

LRDP BP TRANS-6b: For each construction project, LBNL shall require the prime contractor to prepare a Construction Traffic Management Plan that will include, but will not necessarily be limited to, the following elements:

- Proposed truck routes to be used, consistent with the City truck route map.
- Construction hours, including limits on the number of truck trips during the AM and PM peak traffic periods (7:00 to 9:00 AM and 4:00 to 6:00 PM), if conditions demonstrate the need.
- A parking management plan for ensuring that construction worker parking results in minimal disruption to surrounding uses.

LRDP BP TRANS-6c: LNBL shall manage project schedules to minimize the overlap of excavation or other heavy truck activity periods that have the potential to combine impacts on traffic loads and street system capacity, to the extent feasible.

LRDP MM TRANS-8: LBNL shall implement LRDP MM 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 LRDP MM 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).

Project Impacts and Mitigation Measures

Potential project impacts on transportation and traffic are discussed in this section. The traffic study prepared for the LBNL 2006 LRDP EIR found no significant impacts on the CMP roadway system. Since the CRT project would generate fewer vehicle trips than those analyzed under the 2006 LRDP program and would not modify the regional roadway system, it would not exceed the LOS standards established for the CMP roadway system; further evaluation of this impact is not required.

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

The estimated vehicle trips generated by the CRT project as described in the previous section were added to the Near-Term No Project AM and PM peak hour intersection volumes. The resulting Near-Term With Project conditions intersection volumes are shown on Figure 4.12-5, Near-Term With Project Peak Hour Traffic Volumes.

Table 4.12-5 summarizes the Near-Term With Project conditions weekday peak hour intersection LOS analysis results. Detailed calculation work sheets are provided in Appendix 4.12. As shown in the table, the five study intersections would continue to operate at the same LOS as in the Near-Term No Project conditions.

The Stadium Rim Way/Gayley Road and Bancroft Way/Gayley Road intersections would continue to operate at LOS F during both AM and PM peak hours. However, the proposed CRT project would increase intersection volumes by less than 5 percent at these two intersections. Thus, the project would not cause a significant impact at these two intersections.

Mitigation Measure: No project-level mitigation measure required.

CRT Impact TRANS-2: The proposed CRT project would result in increases in transit ridership. (Less than Significant)

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

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

The CRT project would be located near existing LBNL shuttle stops on Cyclotron Road near the Blackberry Canyon Gate, and on Seaborg Road near Building 70. The shuttle service would connect the CRT site with UC Berkeley and downtown Berkeley. It is expected that shuttle ridership and travel times would be monitored as part of the TDM program and, if necessary, shuttle service would be modified to meet the expected demand. This would be a less than significant impact.

Mitigation Measure: No project-level mitigation measure required.

CRT Impact TRANS-3: The proposed CRT project would result in increased parking demand that may exceed the available parking supply. (Less than Significant)

The LBNL 2006 LRDP anticipated that parking supply would increase at the same rate as population increase. Currently, LBNL provides one parking space per 1.7 ADP. Thus, the proposed 300-ADP CRT

project would require 174 parking spaces. However, the proposed CRT project would not increase the parking supply. Therefore, all parking demand generated by the CRT project would be accommodated by existing parking lots.

Considering the practical parking capacity of LBNL, the site currently has about 190 parking spaces available. Combined with the 50 parking spaces at the Helios parking lot, about 240 parking spaces would be available for use by both CRT and Helios projects. The expected supply is less than the estimated increase in parking demand due to the CRT project, and would be even lower if parking demand of the Helios project is also factored in. The proposed TDM program (LRDP MM TRANS-1d) is intended to enhance alternative travel modes to LBNL and reduce parking demand for the site.

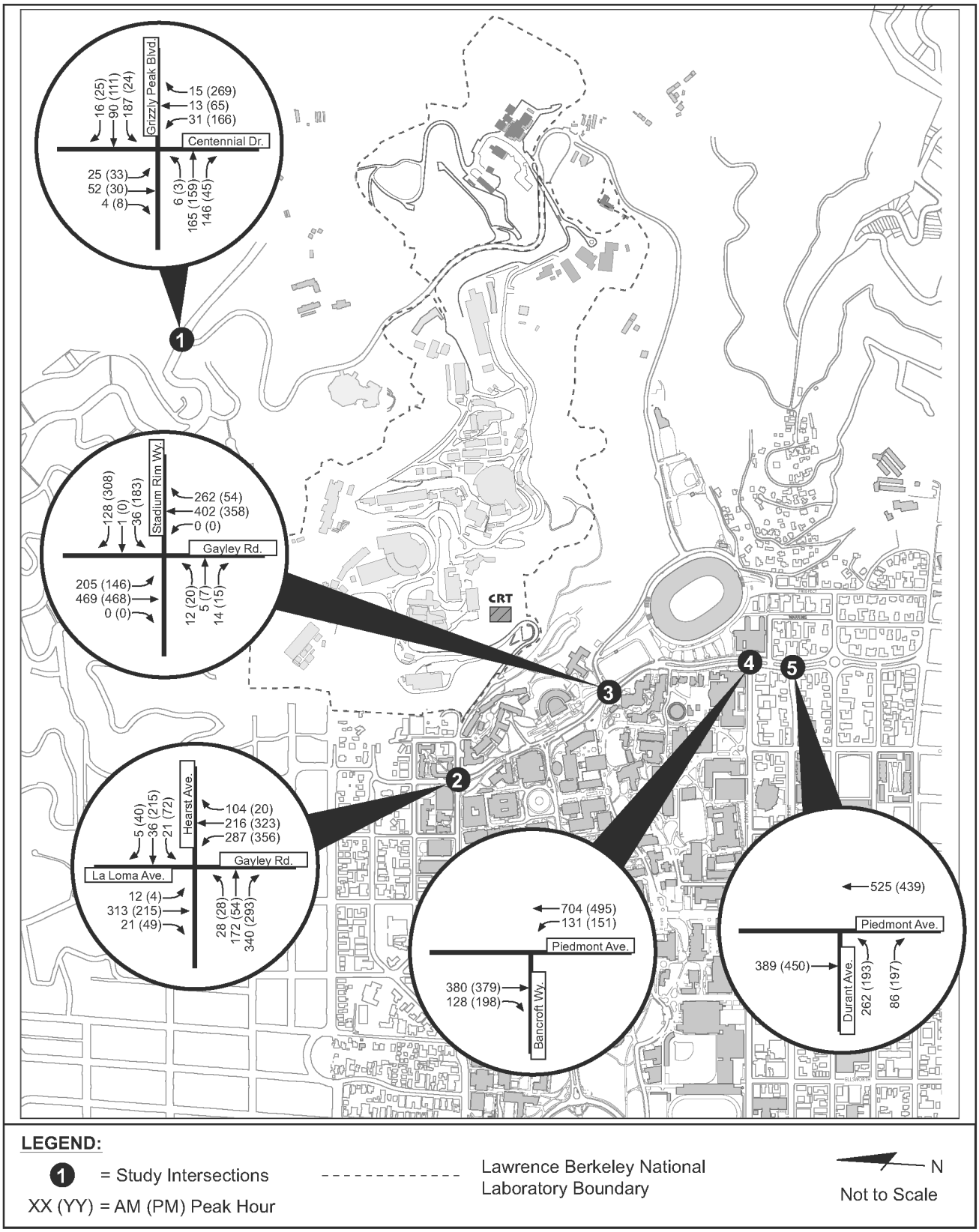
LBNL will Implement LRDP MM TRANS-1d to address potential parking shortfalls with the proposed CRT project. Specifically, the Berkeley Lab will monitor parking demand and, if peak parking demand approaches practical parking capacity, it will limit the number of parking permits issued and explore charging a fee for parking. The impact would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

CRT Impact TRANS-4: The proposed CRT project would potentially result in increased hazards to pedestrians or bicyclists or conflicts with adopted policies, plans, or programs promoting walking or bicycling. (Potentially Significant, Less than significant with Mitigation)

The proposed CRT project would provide only four disabled access parking spaces, which is fewer parking spaces than planned for in the LBNL 2006 LRDP. Thus, more employees and visitors would be encouraged to take transit, bicycle or walk to the site.

Pedestrian paths and walkways would connect the proposed CRT project with the rest of the LBNL site. New stairs would connect the CRT project to Cyclotron Road just west of Blackberry Canyon Gate, providing pedestrian access to the City's sidewalk network via Cyclotron Road and Hearst Avenue.



SOURCE: Fehr & Peers - August 2007

FIGURE **4.12-5**

Near-Term With Project Peak Hour Traffic Volumes

The project would not cause degradation of or disruption to existing pedestrian or bicycle facilities, and the relatively small increase in vehicle traffic would not create a significant long-term conflict with pedestrian/bicycle users.

The proposed CRT project would not result in increased hazards to pedestrians or bicyclists or conflicts with most adopted policies, plans, or programs promoting walking or bicycling. The latest project site plan identifies shower and locker facilities, but it does not identify any bicycle parking facilities. Therefore, the project's impact related to conflicts with adopted policies, plans, or programs promoting walking or bicycling would be potentially significant.

CRT MM TRANS-4: Final design of the CRT building shall provide a minimum of 32 bicycle parking spaces to further encourage bicycling and walking to the site.

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

Construction of the CRT project is expected to start in Spring 2008 and be completed by Summer 2010. Construction could result in temporary impacts from truck traffic, material staging, construction worker commute trips, and parking. LBNL Best Practices 6a through 6c (which are continuing best practices that have been adopted by the Berkeley Lab in conjunction with the approval of the 2006 LRDP) require the contractor to meet with LBNL and prepare a Construction Traffic Management Plan (CTMP) to lessen the impacts of construction on traffic and parking. The CTMP must propose truck routes, limit truck traffic during peak commute period (7:00 to 9:00 AM and 4:00 to 6:00 PM), and prepare a parking management plan for construction workers. A CTMP would be prepared and implemented during project construction.

It is estimated that most of the fill material excavated or needed at the CRT site would be accommodated within the LBNL site. However, up to 7,000 cubic yard (CY) of fill material maybe imported from outside of the LBNL site in the early stages of construction. Assuming that each truck has a 12 CY capacity, the delivery of fill material for CRT project would result in up to 1,166 one-way truck trips (583 inbound full trucks and 583 outbound empty trucks), using City streets. The fill stage of the construction, expected to last about three months, would generate up to 20 one-way truck trips per day using City streets. Following completion of site grading activities, the construction of the CRT project is expected to require about 10 major truck deliveries per day, resulting in 20 one-way truck trips that would use City streets. All construction trucks are expected to travel to and from the site via the Blackberry Canyon Gate on Cyclotron Road. Thus, about 20 trucks would use City streets on a typical day during all stages of

construction. Furthermore, the proposed project will implement LRDP BP TRANS-6a, 6b, and 6c to minimize construction traffic impacts on City streets. LBNL BP TRANS -6a requires the Berkeley Lab to work with the City of Berkeley to review truck routes and CTMP. LBNL BP 6b limits truck traffic during the peak commute periods (7:00 to 9:00 AM and 4:00 to 6:00 PM) and requires the use of designated truck routes. Pursuant to LRDP BP TRANS-6c, the Berkeley Lab will manage project schedules to minimize overlap of heavy truck activity periods of its ongoing projects. The project's impact related to construction truck traffic would be less than significant. To further minimize impacts related to construction activities, the following mitigation measure will also be implemented.

CRT MM TRANS-5: LBNL shall include the following in the CTMP prepared for the proposed project:

- For trucks hauling fill material internal to the LBNL site, trucks should use internal truck routes within the LBNL site to minimize disruption to vehicle, bicycle, and pedestrian circulation and parking.
- Consider stacked parking within the LBNL site or off-site parking for construction workers to minimize parking demand.

4.12.5 References

AC Transit's website, August. 2007.

Bay Area Rapid Transit District. 2007.

City of Berkeley. Berkeley Bicycle Plan Update. February 2005.

Lawrence Berkeley National Laboratory. 2006 Long Range Development Plan Draft Environmental Impact Report, SCH No. 200102046. January 2007.

Lawrence Berkeley National Laboratory. 2006 Long Range Development Plan Final Environmental Impact Report, SCH No. 200102046. Prepared by ESA. July 2007.

LBNL Shuttle website. August 2007.

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UC Berkeley Public Safety and Transportation website. August 2007.

University of California, Campus Bicycle Plan. August 2006.

4.13 Utilities, Service Systems, and Energy

4.13.1 Introduction

This section discusses potential impacts on utilities, service systems, and energy from the implementation of the proposed project. Information presented in the discussion and analysis presented below was drawn from the 2006 Long-Range Development Plan (LRDP) EIR and environmental documents associated with specific LBNL projects.

In response to the Notice of Preparation for this EIR, East Bay Municipal Utility District (EBMUD) noted that in the event that additional water service from EBMUD is needed to serve the proposed project, LBNL should request a water service estimate. EBMUD also requested that the WaterSmart technology and design standards be incorporated into the project. In addition, EBMUD noted that the construction period of a new EBMUD water storage tank may overlap with the construction of the CRT project and other projects; therefore, the EBMUD water storage tank project should be considered in the evaluation of cumulative impacts. EBMUD expressed concern regarding the adequacy of the wastewater collection system to handle project wastewater flows.

Water service is addressed in this section. Lawrence Berkeley National Laboratory (LBNL) has included water conservation measures in the proposed project design (see Section 3.0, Project Description). The EBMUD water storage tank is included in the evaluation of cumulative impacts in other subsections of this EIR (see Section 4.0, Environmental Setting, Impacts and Mitigation Measures), specifically in the evaluation of cumulative impacts from construction traffic and construction noise, and cumulative impacts on biological resources. The project's impact on the wastewater collection system is addressed in this section.

4.13.2 Environmental Setting

The Initial Study prepared to define the scope of this EIR concluded that the proposed project would result in a less than significant impact on solid waste capacity and regulations and telecommunication facilities. Impacts to these utilities and service systems are not discussed further in this EIR and the discussion of environmental setting below focuses on wastewater collection system and treatment plant capacity, storm water, chilled water, electricity, and natural gas.

Wastewater

EBMUD provides wastewater treatment services to parts of Alameda and Contra Costa counties along the east shore of the San Francisco Bay, including the project site. Wastewater from LBNL is collected

and conveyed via the City of Berkeley's public sewer system and EBMUD-operated interceptor sewers to the regional wastewater treatment facility located southwest of the Interstate 80 (I-80) and Interstate 580 (I-580) interchange in Oakland.

Currently, EBMUD's wastewater treatment facility has an average annual daily flow of 80 million gallons per day (mgd) (EBMUD 2007). During wet weather, the treatment plant accepts more flow. The plant has a primary treatment capacity of 320 mgd and a maximum secondary treatment capacity of 168 mgd. After treatment, wastewater is discharged into the San Francisco Bay via a 1-mile-long deep-water outfall line.

LBNL On-Site Wastewater Collection System

Wastewater at the Berkeley Lab is carried via a gravity flow system, owned and operated by LBNL. This system eventually discharges to the City of Berkeley's public sewer system through two monitoring stations, one located at Hearst Avenue (Hearst Monitoring Station) and the other at Centennial Drive in Strawberry Canyon (Strawberry Monitoring Station). The monitoring stations measure the volume of the effluent on a continuous basis. In addition, samples of the effluent are taken at regular intervals and evaluated for radioactivity and other constituents mandated by EBMUD.

Effluent from the western portion of the Lab, including effluent from the project vicinity, flows to the Hearst Monitoring Station, from where it ties into the City of Berkeley's sewer system at City sanitary sewer sub-basin 17-013.

Wastewater Generation

Annual wastewater generation at LBNL is approximately 38 million gallons, with personal wastewater accounting for approximately half and process water from research areas accounting for the other half. While sewer flows vary widely according to the time of day and time of year, the Lab's approximate peak daily flow is about 274,000 gallons per day (gpd) during dry weather conditions and 821,000 gpd during peak wet weather conditions (LBNL 2007). At the Hearst Monitoring Station, the average wastewater flow is about 50,000 gpd and can range from 30,000 to 100,000 gpd. At the Strawberry Monitoring Station, LBNL's approximate average daily flow is 100,000 gpd and can range from 50,000 to 170,000 gpd (Pauer 2007). These ranges represent averages throughout the year. The effluent flow at the Strawberry Monitoring Station also includes wastewater from the UC Berkeley Hill Campus area buildings, which contribute about half of the amount measured.

Sewer System Conditions and Upgrades

The main concern with wastewater flow near the project site and region wide in the EBMUD system is the infiltration and inflow (infiltration/inflow or I/I) of storm water into the sanitary sewer lines attributed to the poor condition of aging sewer pipes. Increased wastewater flow during wet weather conditions is attributed to the infiltration/inflow of storm water into the sanitary sewer system, and results in the EBMUD treatment facility receiving about seven to 10 times as much wastewater on wet days as on a peak dry weather day. However, LBNL sewers are maintained in very good condition. LBNL has acted to address I/I problems in its system through a concerted sewer infrastructure upgrade program. A plumbing maintenance and upgrade effort has been undertaken during the past 15 years by LBNL, along with installation of water-saving devices and systems, to substantially lower average sewer flows. These ongoing efforts have reduced both peak wet weather as well as average sewer flows by well over half. Moreover, LBNL's peak wet weather I/I rate is less than half that of the City of Berkeley, and it is only approximately 10 percent of that found in the EBMUD service district on average (LBNL 2007). LBNL continues to seek ways to reduce both water consumption and sewage generation.

LBNL currently pays EBMUD for assessed sewer services. The University has also contributed to the City of Berkeley's sewer upgrade program, which is intended to increase wet weather flow capacity and decrease I/I conditions. The City of Berkeley's I/I correction program was initiated in 1987 and includes rehabilitation or replacement of 50 percent of the City's existing system over 30 years, as well as installation of 12 miles of new sewer lines to accommodate overflow conditions by the year 2007. By 1999, over 25 percent of the planned replacement and rehabilitation had been completed and 10 miles of the proposed 12 miles of new sewer lines had been installed. An interceptor line along Adeline Street, completed in 1992, now conveys wet weather flow to EBMUD's storage and treatment facilities. The City's I/I correction program allows for a 20 percent increase in the base wastewater flow due to changes in land use or population (City of Berkeley 2001).

Wastewater from LBNL's western portion, including the CRT project site, generally flows into sub-basin 17-013 by way of the Hearst Monitoring Station. The sanitary sewer lines on Hearst Avenue are relatively new and in good condition, and they flow directly into the interceptor on Shattuck Avenue. Sub-basin 17-013 is not currently constrained during peak wet weather flows, and it is expected to have future wet weather capacity to meet LBNL's growth needs during the term of the 2006 LRDP (LBNL 2007).

Effluent from LBNL's eastern portion (and upstream UC Berkeley Hill Campus buildings) generally is routed into pipes exiting the Berkeley Lab at Centennial Drive. No effluent from the CRT project site will flow into this section of the Lab's sewer system.

Storm Water Drainage

The LBNL storm drain system is a gravity-fed network of open and culverted drainage conveyances, running generally east to west. Drain pipes range from 4 to 36 inches in diameter and consist of metal, polyvinyl chloride (PVC), concrete, and tile pipe. Run-on (i.e., water draining onto the site from off-site locations) enters the LBNL site via open drainage channels and combines with runoff from the LBNL site. The combined drainage is conveyed across developed portions of the Berkeley Lab via underground piping, and is then discharged at established open drainage channels of the Strawberry Creek watershed, into both the north fork of Strawberry Creek to the north and to Strawberry Creek itself to the south. The existing storm water drainage system is designed to handle flows expected in a 100-year storm. An expanded discussion of the existing and proposed on-site storm water drainage system is included in Section 4.7, Hydrology and Water Quality.

Water

EBMUD provides water service to the cities of Berkeley and Oakland, including the Berkeley Lab site. EBMUD provides the high pressure water supply for LBNL at two separate connections. The primary connection is to EBMUD's Shasta Pressure Zone, which provides water service to customers within an elevation range of 900 to 1,050 feet and has a 2 million-gallon capacity. The second connection is to the Berkeley View Pressure Zone, which provides water service to customers within an elevation range of 1,050 to 1,250 feet and has a 1 million-gallon capacity. The Lab receives its water through a 12-inch meter on Campus Drive in the Shasta Pressure Zone and a 6-inch meter on Summit Road from the Berkeley View Pressure Zone. High pressure water is distributed throughout LBNL by an extensive piping layout providing domestic and fire protection water to the site. The Lab's system also supplies make-up water for cooling towers, irrigation water, and water for other on-site miscellaneous uses. The system includes fire hydrants, fire department connections, and sprinkler services to almost all LBNL buildings. All utility systems within the Laboratory's boundary are owned and operated by the Laboratory. The on-site water delivery system at LBNL and connection to off-site pipes are sized for firefighting, which requires roughly 20 times larger capacity than the infrastructure necessary for water delivery for daily use (LBNL 2007).

To supplement the water supply provided by EBMUD, LBNL operates and maintains three 200,000-gallon water storage tanks on site for emergency water supply in the event of service interruption from EBMUD. One tank is located near Building 82 in the Central Research Area, one is located at Building 68 in the Grizzly Operations Support Area, and the third tank is located above Building 85 in the East Canyon Area. The tanks at Buildings 82 and 68 are each equipped with a diesel-powered pump and automatic controls to pressurize LBNL's water distribution system if EBMUD service is interrupted. The

tank located near Building 85 will continue to maintain water flow for the fire protection system during emergencies by gravity. In normal operation, water is slowly circulated from the LBNL system through the 200,000-gallon tanks so they are always filled with potable water and the full 600,000 gallons are always available if required (LBNL 2007).

During 2003, total annual water consumption at LBNL was approximately 41.6 million gallons. Of the total water demand, personal water use, or water used directly by the Lab population for consumption and sanitary purposes, accounted for slightly less than 50 percent of the total demand, or 20.5 million gallons. Process water, used for research, cooling, heating, industrial, cleaning, construction, and landscaping purposes, accounted for the balance of total water use (LBNL 2007).

Over time, the demand for water at LBNL has been decreasing due to improved efficiency on site. Between 1990 and 2003, total annual water use, including both personal water and process water, decreased from approximately 78.6 million gallons to 41.6 million gallons. This represents about a 47-percent reduction in water use. During this time, the building gross square footage at LBNL increased by about 9 percent (from approximately 1.62 million gross square feet [gsf] to 1.76 million gsf). This improved efficiency has been achieved in several ways, including cooling tower efficiency upgrades and installation of low-flow commodes, showers, and wash basin faucets (LBNL 2007).

Chilled Water

LBNL does not maintain a site-wide chilled water distribution system. Berkeley Lab buildings that require chilled water are supplied by on-site chillers and cooling towers.

Electricity

Electrical power at the Berkeley Lab is purchased from the Western Area Power Administration and delivered by the Pacific Gas and Electric (PG&E) transmission system to the Berkeley Lab's Grizzly Substation located adjacent to Building 77. PG&E delivers power to LBNL on two overhead 115-kilovolt (kV), 3-phase, 60-Hertz (Hz) transmission lines with a joint capacity of approximately 100 megawatts (MW). Both of these transmission lines feed power from PG&E's El Sobrante switching station to the Grizzly Substation. The Grizzly Substation consists of two DOE-owned 120/12 kV power transformers with a combined capacity of 100 MW. This substation is for the exclusive use of LBNL. In addition, LBNL's power can be supplied from UC Berkeley's Hill Area Substation, located adjacent to the Grizzly Substation.

The main power distribution system at the Berkeley Lab consists of a 12.47-kV underground system with smaller substations and transformers that reduce voltage to 480/277 volts (V) or 208/120 V. The 12.47-kV

distribution system has dual primary feeders to provide reliable power. Certain buildings are equipped with special voltage regulation in order to ensure that critical experiments will not be disrupted by transient voltage within the system. Total electrical power consumption at LBNL in 2006 was 71,100 megawatt hours (MWh) (Energy Management System 2007).

LBNL also has a number of stationary and portable emergency power generators. These generators start automatically in the event of a power failure and are used to provide an emergency power supply for certain critical services (e.g., for laboratory exhaust fans, exit lights, the fire station, Radio Communications Facility, and the Health Services Building) and other important activities at LBNL. The generators are powered either by diesel, gasoline, or natural gas. The total generating capacity of these emergency generators is approximately 6,250 kilowatts.

Natural Gas

Natural gas is used at the Berkeley Lab for heating all buildings, equipment, operations, and some experimental uses. The natural gas supply is provided by the Defense Fuel Supply Center in Oregon and delivered by the PG&E system. The LBNL natural gas system receives its supply from a 6-inch PG&E line operating at 50 pounds per square inch gauge (psig). The point of delivery is a meter vault in the hillside area above Cyclotron Road and below Building 88. A 6-inch gas line operating at 13.5 psig distributes high-pressure natural gas from PG&E's metering vault to the buildings throughout the Lab. Current (2006) natural gas usage is approximately 1.5 million Therms, or about 20,000 British thermal units (BTU) per gross square foot (Energy Management System 2007).

4.13.3 Regulatory Considerations

State Regulations

Planning for energy is regulated at the state level. Specific regulations that would be relevant to implementation of the proposed project are described below.

Title 24

Buildings constructed after June 30, 1977 must comply with standards identified in Title 24 of the California Code of Regulations. Title 24 requires the inclusion of state-of-the-art energy conservation features in building design and construction, including the incorporation of specific energy-conserving design features, use of non-depletable energy resources, or a demonstration that buildings would comply with a designated energy budget.

2006 LRDP Principles and Strategies[1]

The 2006 LRDP proposes four fundamental principles that form the basis for the development strategies provided for each element of the LRDP. The two principles most applicable to utilities-related aspects of new development are to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship" and to "Build a safe, efficient, cost-effective scientific infrastructure capable of long-term support of evolving scientific missions." Development strategies set forth in the 2006 LRDP that are applicable to utilities include the following:

- Protect and enhance the site's natural and visual resources, including native habitats, riparian areas, and mature tree stands by focusing future development primarily within the already developed areas of the site;
- Provide flexibility in the identification of land uses and in the siting of future facilities to accommodate the continually evolving scientific endeavor;
- Increase development densities within areas corresponding to existing clusters of development to preserve open space and enhance operational efficiencies and access;
- To the extent possible, site new projects to replace existing outdated facilities and ensure the best use of limited land resources;
- To the extent possible, site new projects adjacent to existing development where existing utility and access infrastructure may be utilized;
- Site and design new facilities in accordance with University of California Presidential Policy for Green Building Design to reduce energy, water, and material consumption and provide improved occupant health, comfort, and productivity;
- Exhibit the best practices of modern sustainable development in new projects as a way to foster a greater appreciation of sustainable practices at the Lab;
- Utilize native, drought-tolerant plant materials to reduce water consumption; focus shade trees and ornamental plantings at special outdoor use areas;
- Minimize impervious surfaces to reduce storm water runoff and provide landscape elements and planting to stabilize slopes, and reduce erosion and sedimentation;
- Maintain a safe and reliable utility infrastructure capable of sustaining the Lab's scientific endeavors;
- Consolidate utility distribution into centralized utility corridors that generally coincide with major roadways;

1 While this Environmental Impact Report is a "stand alone" analysis that does not rely upon tiering from any programmatic CEQA document, Berkeley Lab does actively follow the 2006 Long Range Development Plan (LRDP) as a planning guide for Lab development. Accordingly, relevant 2006 LRDP principles, strategies, and design guidelines are identified in this section.

- Ensure that utility infrastructure improvements accommodate future facility expansion and alterations in the most cost-effective means possible; and
- Design infrastructure improvements to embody sustainable practices.

LBNL Design Guidelines

The LBNL Design Guidelines were developed in parallel with the 2006 LRDP and provide specific guidelines for site planning, landscape and building design as a means to implement the 2006 LRDP's development principles as each new project is developed. The LBNL Design Guidelines provide the following specific planning and design guidance relevant to the utilities-related aspects of new development:

- Provide appropriate site lighting for safety and security;
- Segregate public entries and paths from service entries and paths where feasible; and
- Reduce the amount of impermeable surfaces at the Lab.

UC Policy on Sustainable Practices

As discussed in Section 3.0, the proposed project would be consistent with the UC Policy on Sustainable Practices. This policy implements guidelines for new building construction related to energy efficiency and sustainable materials. The goal for new construction is to outperform the requirements of Title 24 energy-efficiency standards by at least 20 percent.

4.13.4 Impacts and Mitigation Measures

Significance Criteria

The impact of the proposed project on utilities, service systems, and energy would be considered significant if it would exceed the following Standards of Significance, in accordance with Appendix G of the California Environmental Quality Act (CEQA) Guidelines and the UC CEQA Handbook:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing entitlements and resources, or new and expanded entitlements needed;

- Result in the need for increased chilled water or steam generation capacity or major distribution improvements;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs;
- Not comply with federal, state, and local statutes and regulations related to solid waste;
- Require or result in the construction or expansion of electrical or natural gas facilities which would cause significant environmental impacts; or
- Require or result in the construction or expansion of telecommunication facilities which would cause significant environmental impacts.

Issues Not Discussed Further

The Initial Study found less than significant impacts to solid waste capacity, solid waste regulations, and telecommunication facilities. Implementation of the project would not cause any landfill to exceed its permitted capacity and would result in a less than significant impact related to solid waste. The proposed project would not affect telecommunication facilities and no impact would occur. These issues are not discussed further in this section.

Mitigation Measures included in the Proposed Project

The following mitigation measures, adopted as part of the 2006 LRDP, are required by the LRDP for the proposed project and are thus included as part of the proposed project. The analysis presented below evaluates environmental impacts that would result from project implementation following the application of these mitigation measures. These mitigation measures that are included in the project would be monitored pursuant to the Mitigation Monitoring and Reporting Plan that will be adopted for the proposed project.

LRDP MM UTILS-2: LBNL shall implement programs to ensure that additional wastewater flows from the Berkeley Lab are directed into unconstrained sub-basins, as necessary and appropriate. LBNL shall continue to direct the Lab's existing western effluent flows into sub-basin 17-013. In addition, new flows at the Berkeley Lab shall be directed into either sub-basin 17-013, sub-basin 17-304, unconstrained portions of sub-basin 17-503, or another subbasin that has adequate capacity. Final design and implementation of these improvements shall be negotiated

between the appropriate parties and shall undergo appropriate environmental review and approval. LBNL shall closely coordinate the planning, approval, and implementation of this mitigation measure with the City of Berkeley and UC Berkeley, as appropriate.

LRDP MM UTILS-4: LBNL shall develop a plan for maximizing diversion of construction and demolition materials associated with the construction of the proposed project from landfill disposal.

Project Impacts and Mitigation Measures

CRT Impact UTILS-1: Implementation of the CRT project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board and would not require an expansion of the EBMUD wastewater treatment plant or an expansion of the City's sewer conveyance facilities. (Less than Significant)

The proposed project would generate wastewater in the form of wastewater from restrooms and cooling tower blowdown. No hazardous chemicals would be used in the cooling towers, and these sources would contain typical wastewater constituents. The combined wastewater sources would generate on average approximately 5,600 gpd, with up to 9,000 gpd during peak periods, during initial project operations. The combined sources would generate on average approximately 6,000 gpd, with up to 21,000 gpd during peak periods, at buildout. EBMUD has previously indicated the wastewater treatment plant has sufficient capacity to serve all of the development envisioned under the 2006 LRDP. Therefore, there is sufficient capacity at the wastewater treatment plant to serve the proposed project. An increase above the limits on the amount of sewage treated at EBMUD's wastewater treatment plant could result in the plant being unable to meet pollutant standards outlined in the National Pollutant Discharge Elimination System permit issued by the Regional Water Quality Control Board (RWQCB). Since there is sufficient treatment capacity to accommodate the wastewater discharged by the proposed project, the limit on the amount of sewage treated would not be exceeded. Therefore, the plant would be able to adequately treat project-generated sewage in addition to existing sewage and the treatment requirements of the RWQCB would not be exceeded.

The project proposes to extend sewer lines from the lower west side of the CRT project to the existing sewer system in Cyclotron Road. Wastewater from the CRT project would be conveyed to existing sewer pipes that direct wastewater to Hearst Monitoring Station and then into sub-basin 17-013, located west of the project site. Sub-basin 17-013 is not currently constrained during peak wet weather flows, and it is

expected to have future wet weather capacity to meet LBNL's growth needs during the term of the 2006 LRDP (LBNL 2007).

As noted above, the proposed project would direct sewer flows to sub-basin 17-013, and would not contribute to capacity exceedances in sub-basin 17-503. This impact is considered less than significant.

Mitigation Measure: No project-level mitigation required.

CRT Impact UTILS-2: The proposed project would result in an increase in storm water flows but would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (Less than Significant)

Implementation of the CRT project would increase impervious surfaces on the LBNL site by approximately 1.36 acres, which would result in an increase in storm water flows. According to the 2006 LRDP EIR, the existing LBNL storm water drainage facilities have adequate capacity to serve existing and future development in the area. The project includes design features consisting of vegetated swales and a network of inlets, hydromodification vaults, and drainage pipes to capture and hold peak storm flows and release them at a rate no greater than predevelopment conditions. As a result, the project would maintain storm water runoff at existing levels, and would not increase the flow rate of storm water into the LBNL storm drain system or into the City storm drain system or natural drainages in the project area. Therefore a significant environmental impact from the construction of new storm drainage facilities would not occur. The impact would be less than significant.

Mitigation Measure: No project-level mitigation required.

CRT Impact UTILS-3: Implementation of the proposed CRT project would increase the demand for water but could be served by existing resources. The project-related demand for water supply would not result in the need for new or upgraded water facilities. (Less than Significant)

As discussed in Section 3.0, Project Description, the CRT project would require approximately 29.3 million gallons per year (mgy) at buildout for potable and cooling water. The project would be served by EBMUD from the existing supply and distribution system. As shown in Table 4.13-1, Estimated Lab-Wide Water Demand, the total projected water demand for the CRT project combined with other planned Berkeley Lab growth would be approximately 80 mgy. Because water use has been declining annually, actual existing use at the Berkeley Lab is likely to be lower than 41.6 mgy, and these figures therefore represent a conservative estimate of projected water use.

Table 4.13-1
Projected Lab-Wide Water Demand

Water Use Component	Estimated Water Demand (mgy)
Existing Use (2003)	41.6
CRT Project	29.3
Helios Project	4.8
Other	4.3
TOTAL	80

Source: LBNL 2007; Dong 2007.

LBNL submitted a request to EBMUD to prepare a water supply assessment (WSA) for growth proposed under the LRDP. EBMUD submitted the WSA to LBNL in a letter dated November 23, 2004 and confirmed by EBMUD on February 23, 2006. EBMUD confirmed that the LRDP project's estimated water demand is accounted for in EBMUD's water demand projections, as published in the 2000 Urban Water Management Plan. After the adoption of the 2006 LRDP, and in conjunction with the development of the design of the CRT project, the Berkeley Lab determined that additional water would be needed to serve the growth of LBNL under the 2006 LRDP. In order to address the project-specific water demand for the CRT project, the Berkeley Lab presented its revised estimate of 80 million gallons of water needed per year through 2025 (compared to about 61 mgy, which was the previous estimate under the 2020 LRDP) to EBMUD. EBMUD has indicated that it can provide this volume of water to LBNL from its existing supply sources (O'Hearn 2007). Therefore, the proposed project, in conjunction with other growth at LBNL, would not result in a demand for water that would require EBMUD to develop new water supply sources. Furthermore, no improvements to water supply mains are necessary to serve the CRT project or the projected growth at LBNL. Therefore, the proposed project would not result in environmental impacts from the construction of water infrastructure improvements. The impact would be less than significant.

CRT Impact UTILS-4: The proposed project would result in the need for additional chilled water facilities, the construction and operation of which would not result in a significant environmental impact. (Less than Significant)

LBNL does not maintain a site-wide chilled water distribution system. LBNL buildings that require chilled water are supplied by on-site chillers and cooling towers. Therefore, implementation of the proposed project would not impact any centralized chilled water distribution system. The CRT project proposes up to nine cooling towers that would meet the demand of the proposed project and would be located adjacent to the eastern end of the building. Construction and operation of the cooling towers is

not expected to cause any specific significant environmental impacts beyond what is analyzed for the proposed project in other sections of this EIR, notably Section 4.2, Air Quality, and Section 4.9, Noise. As the analyses in those sections show, the environmental impacts from the construction and operation of the cooling towers would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

CRT Impact UTILS-5: Implementation of the proposed CRT project would increase the demand for electricity and natural gas but would not result in the expansion of existing or construction of new electrical and natural gas facilities. (Less than Significant)

The CRT project would use 7 MW of electricity during initial project operations and up to 17 MW at project buildout. This represents approximately one percent of the total demand projected under the 2006 LRDP. The CRT project includes numerous energy-saving measures, including energy-efficient lighting and building systems and design features to reduce heat gain. Two options are being considered for provision of the required power to the CRT project: an increase in power obtained from the existing grid, or natural-gas-powered cogeneration equipment that would provide up to 3 MW of power, combined with increased power from the grid (see Section 3.0). If the cogeneration option is implemented, the CRT project would increase the demand for natural gas by about 2.3 million Therms per year. This projected demand for natural gas is minimal (less than 0.02 percent) when compared to total natural gas consumption of about 12,769 million Therms in California in 2000 (LBNL 2007).

Power supply lines for the project would connect to the existing power lines near the Buildings 50/70 complex. If the project does not include cogeneration, all power would be supplied from the existing grid. Upgrades to the Grizzly Peak substation and transmission facilities within LBNL would be needed in order to accommodate the project's power needs with either option. These upgrades would be accomplished entirely within the footprint of existing utilities or the CRT project site as detailed in Section 3.0. With on-site cogeneration equipment, the CRT Facility would generate approximately 18 percent of CRT's electricity demand. Cogeneration would be provided by two 1.5 MW engine-generator units powered by natural gas; they would be located northeast of the building in the same area as the cooling towers and would be enclosed by masonry or concrete walls to provide security and noise shielding. Under this option, an existing sub-grade 6-inch high-pressure natural gas main would serve the project. Environmental impacts associated with the cogeneration equipment (primarily related to air quality) are evaluated in Section 4.2.

The project's demand for electricity by itself would not require the construction of new power generation facilities, and the project's impact related to off-site generation facilities would also be less than

significant. The project's demand would, however, combine with the demand for electricity associated with other proposed projects in the region and could contribute to the need for an expansion of an existing power plant or the construction of a new power plant. Sources of electricity are diverse and widespread, and supply is usually made from a number of sources. Both electricity and gas needed by the project may in fact be generated out of state. It is therefore not reasonable to predict where the supply sources would be located or to evaluate the environmental consequences from the construction and operation of such facilities. Furthermore, if the new power generation facilities were to be located in California, they would be subject to environmental review and would be required to avoid or minimize their environmental impacts. Accordingly, the project's contribution to the impact related to new generation facilities would be less than significant.

Mitigation Measure: No project-level mitigation measure required.

4.13.5 References

Dong, Mike, Personal Communication, November 2, 2007.

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